DECEMBER 11, 1961

PAPER TRADE JOURNAL

On- or Off-Machine Coaters? Top Panel Offers Some Vital Answers

One Finishing Expert Finds Home For The Orphan of Our Industry

Sunny Ray Peeps Through "Sales Up, Profits Down" Gloom at ¾ Mark

Plus... Art in the Paper Industry & Aspects of Modern Drying Theory

Contents of the Week, pages 4-5

Celebrating 75 Years of Service to the World's Pulp and Paper Industry

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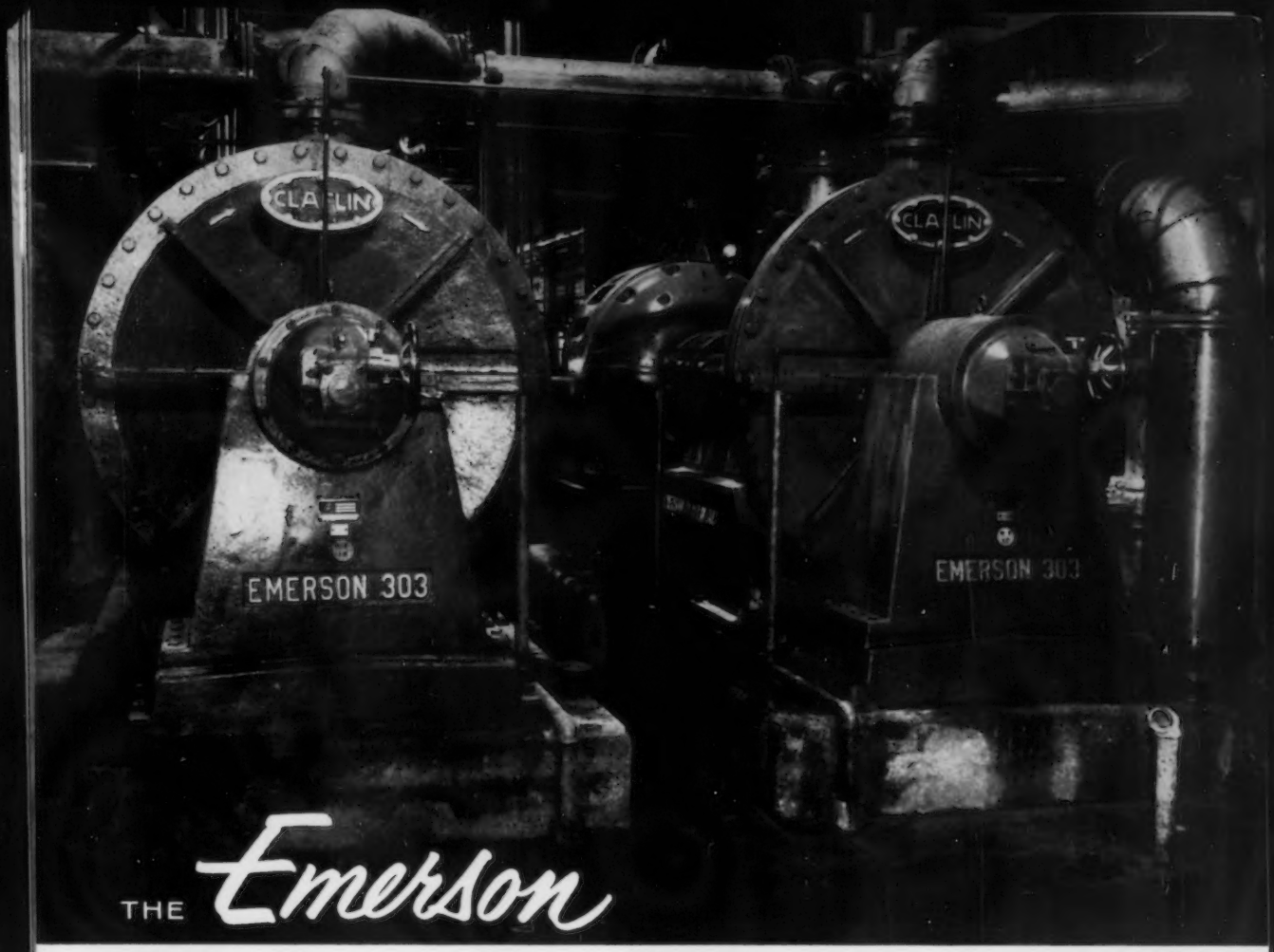

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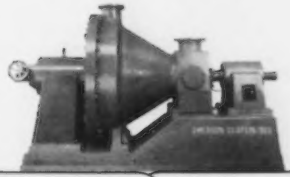
At ALTON BOX BOARD COMPANY *rugged service year in, year out* The Emerson Claflin's demonstrated ability to give dependable, trouble-free performance in the defibering and high strength development of waste fibers using cast fillings in the manufacture of corrugating medium, liner, folding and set-up boxboard has led to repeat business from the Paperboard Division, Alton, Illinois.

At BRUNSWICK PULP AND PAPER COMPANY *a new installation* Emerson Claflins were chosen over all other refiners to process sulphate pine and gum fibers in the South's newest bleached board mill at Brunswick, Georgia.

At GEORGE O. JENKINS COMPANY *an unusual application* Faced with the difficult assignment of refining sole leather nubs left undefibered from 6 beaters, special tackle was designed. As a result, one Emerson Claflin has solved this serious mill problem in the manufacture of leatherboard at Bridgewater, Massachusetts.

ONLY EMERSON MAKES THE CLAFLIN



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Week of December 11, 1961
Vol. 145, No. 50

FEATURED THIS WEEK

Art in Industry

We are privileged to reproduce here a series of woodcuts specially commissioned by Scott Paper Co., depicting several scenes in the manufacture of pulp and paper **28**

Coatings—On-Machine Vs. Off-Machine

One of the hottest subjects in the paper industry! A panel of experts in this field points to the factors that should be considered before deciding on a new coating installation **34**

Finishing Comes of Age

The "orphan" of the industry is growing up! A variety of modern equipment is available that finally makes possible automation of the finishing line! An expert in this field tells how to take advantage of new finishing machinery—Leslie S. Pearson **38**

Some Aspects of Modern Drying Theory

A review of what is known to happen during the process of drying paper. This is particularly timely because of the many reported difficulties in the application of high velocity air-dryers—R. R. Rounsley **44**

Third Quarter Profits Present Welcome If Modest Change

Industry earnings begin to move upward but the effect of the few belated and modest price increases was slight as they occurred so late in the quarter—John W. Saunders **47**

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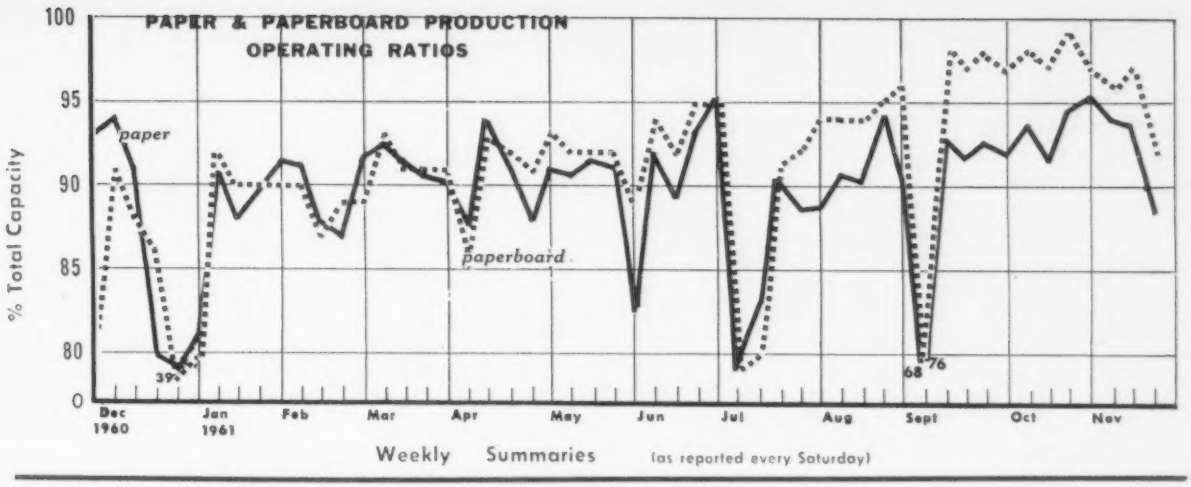

NEWS OF THE WEEK

Riegel Paper Establishes Central Research Group at Milford, N. J. . . . U. S. Court Rejects Union Bag Offer To Acquire Doeskin . . . Great Northern Orders Complete Off-Machine Coating Line . . . No New Mill For Warren . . . . . .

Waitt Elected V.P. By Spaulding Fibre . . . St. Regis Chooses Smith To Manage Tacoma Mill . . . Massillon Paper Announces Executive Changes . . . Union Bag-Camp Fills Newly Created Post . . . Comette, Newman & Rust Step Up at Ontario Paper . . . . . .

Pump Incorporates Archimedes Screw Principle . . . Single-Ply Conveyor Belt Does Work of Seven . . . Analog Computer Also Controls Flow, Pressure & Temp. Systems . . . Asphaltic Resin Useful in Molded Paper Products . . . . . .

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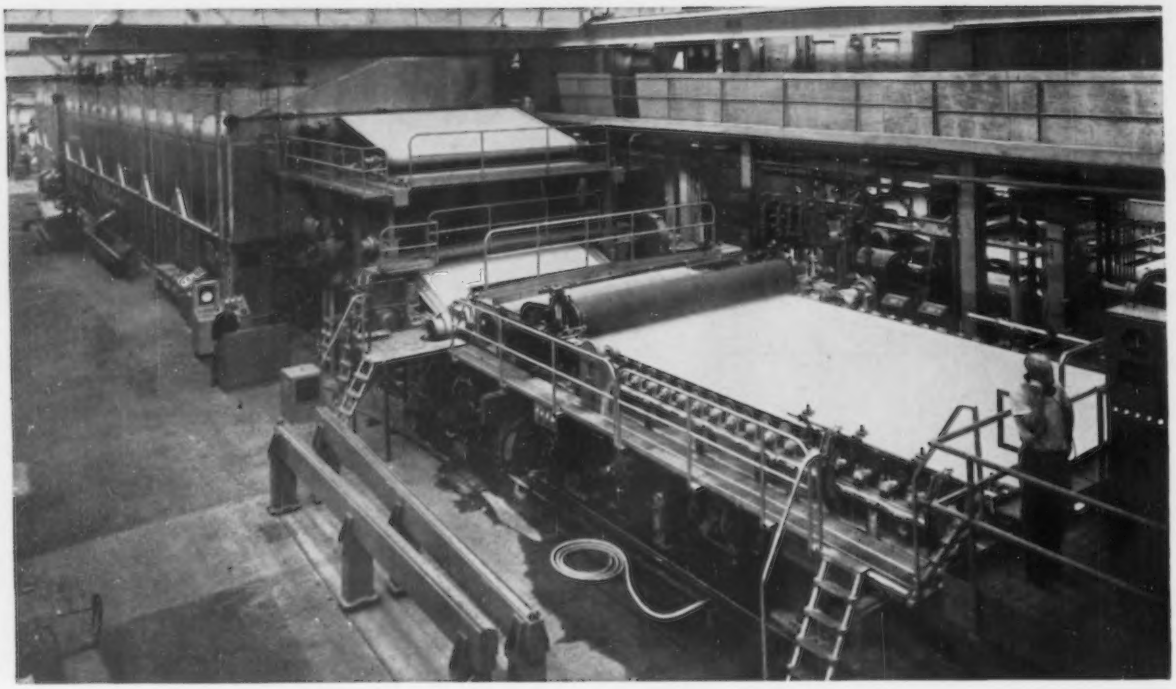
REMEMBER THESE DATES

CPPA Technical Section, Annual Meeting, Queen Elizabeth Hotel, Montreal, Canada — JANUARY 22-26

Paper Week, New York City — FEBRUARY 19-22



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*Patent Applied For.

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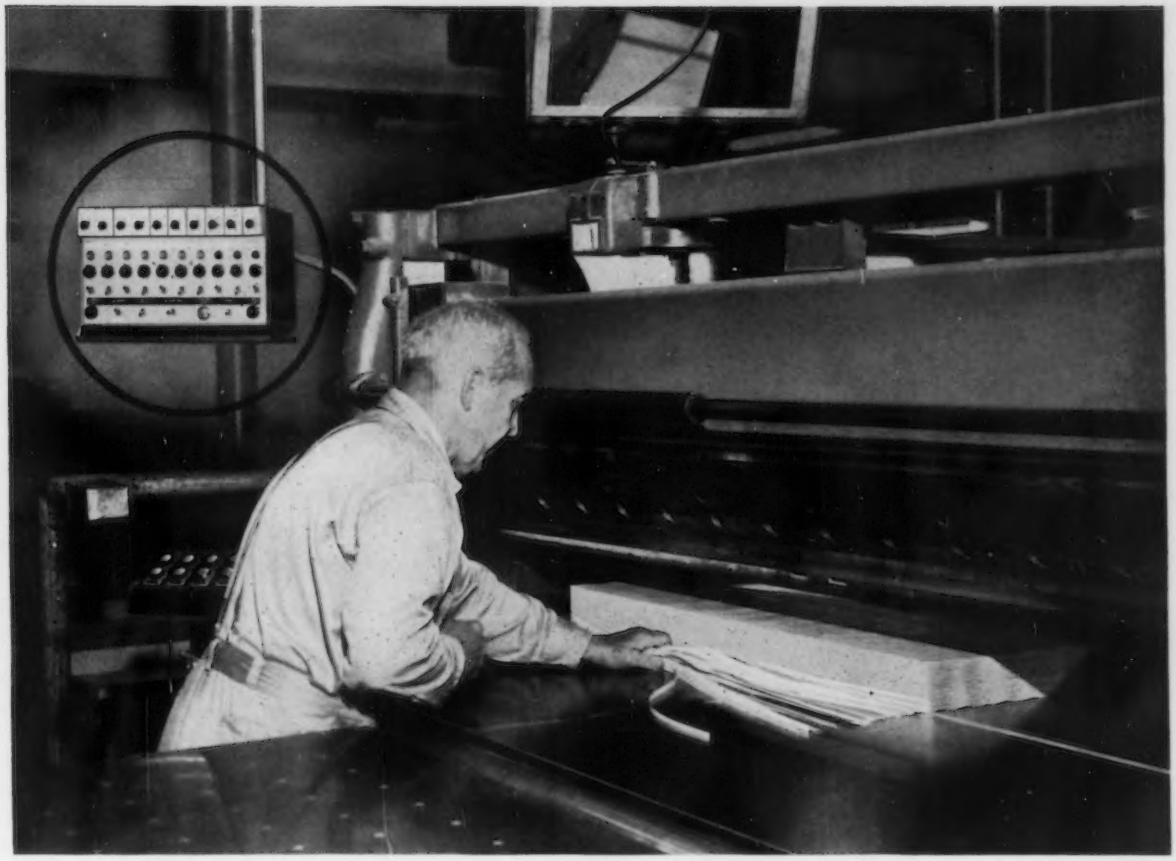
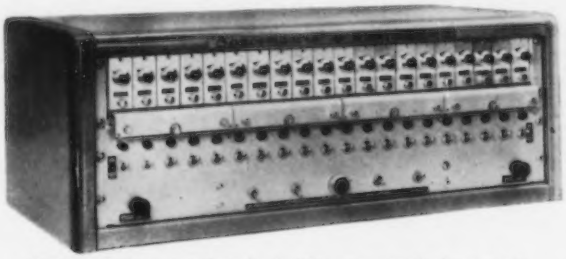


"Spacemastre" Automatic Spacers increase trimmer output at Consolidated Water Power & Paper Co.

To improve on exacting production standards and increase the efficiency of trimmer output, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wisconsin, installed its first Smith & Winchester "Spacemastre" Automatic Spacer in November 1960. In September 1961, two more units were added — concrete evidence of satisfaction by this well known concern, specialists in the manufacture of a complete line of enamel papers for offset and letterpress printing.



Latest design transistorized "Spacemastre" Automatic Spacer. Provides long life, greater reliability of circuit performance. 20-position programming, permits several pre-set cutting cycles. Each pre-set cutting cycle can be stored.

The "Spacemastre" Automatic Spacer can increase your present trimmer production as much as 50% by accelerating and fully automating the back gauge movement. And the "Spacemastre" Spacer can be installed on any width or length guillotine-type trimmer having a screw operated back gauge.

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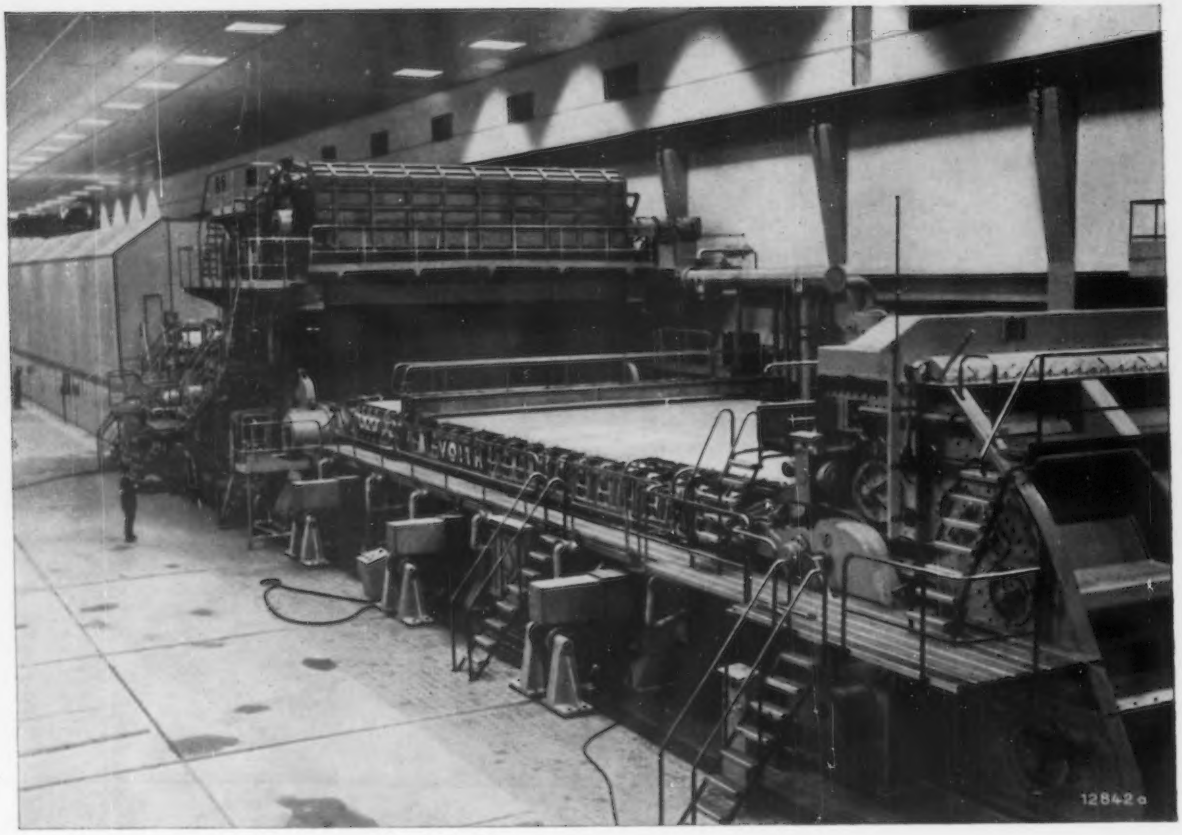
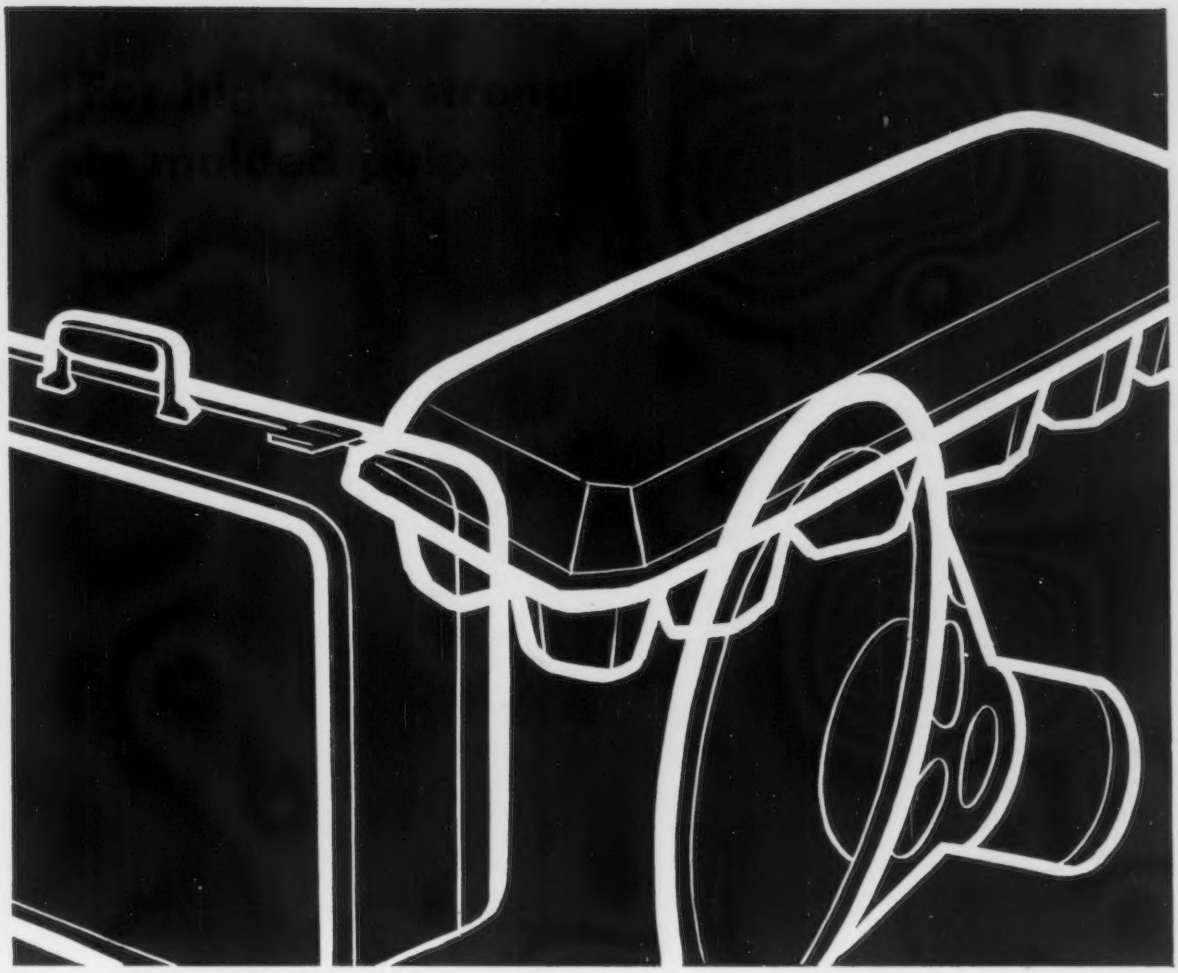


EUROPE'S WIDEST PAPER MACHINE IN OPERATION

At Warkaus, the new Voith 327 inch. Paper-making Machine No. 725 was started up to operate at an initial speed of 1770 f.p.m. on October 23, 1961. The initial gross production target, 300 tons 24 hr of newsprint of 52 g/m², was reached already after few days. Ever since the start-up, the excellent formation of the sheet produced has been most impressive.

J. M. VOITH GMBH · HEIDENHEIM (BRENZ) · GERMANY



Shawinigan GELVA® polyvinyl acetate emulsions

When toughness and rigidity are properties necessary in your molded pulp products investigate GELVA emulsions as wet end additives. Substantially increased strength and stiffness can be obtained with relatively small quantities of emulsion. The chart, right, presents data based on laboratory tests performed with three GELVA emulsions representative of Shawinigan's diversified line.

Shawinigan's products for paper applications include both GELVA polyvinyl acetate emulsions and resins and GELVATOL polyvinyl alcohol resins. A wide variety of standard grades is always available. Shawinigan's research staff and laboratories are ready to assist you with formulations for special applications. Write to Shawinigan Resins Corporation, Dept. 7I, Springfield 1, Massachusetts.

	% Resin add-on (dry)	Flexural Strength lbs/in²	Relative Rigidity	Gain in weight 24 hrs water immersion at 25°C.
Control — no resin additive	0	3000	1.00	240%
Gelva Emulsion S-51	10	6330	1.97	115%
Gelva Emulsion C-3	10	5520	1.91	140%
Gelva Emulsion S-55	10	4480	1.43	136%

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If you wish the facts on 2-stage bleaching of groundwood pulp, using hydro for the second stage, wire, phone or write us. We will send data—or, if you prefer, a "Virginia" technical man. Write Chemical Division, VIRGINIA CHEMICALS & SMELTING COMPANY, Dept. 298, West Norfolk, Va.

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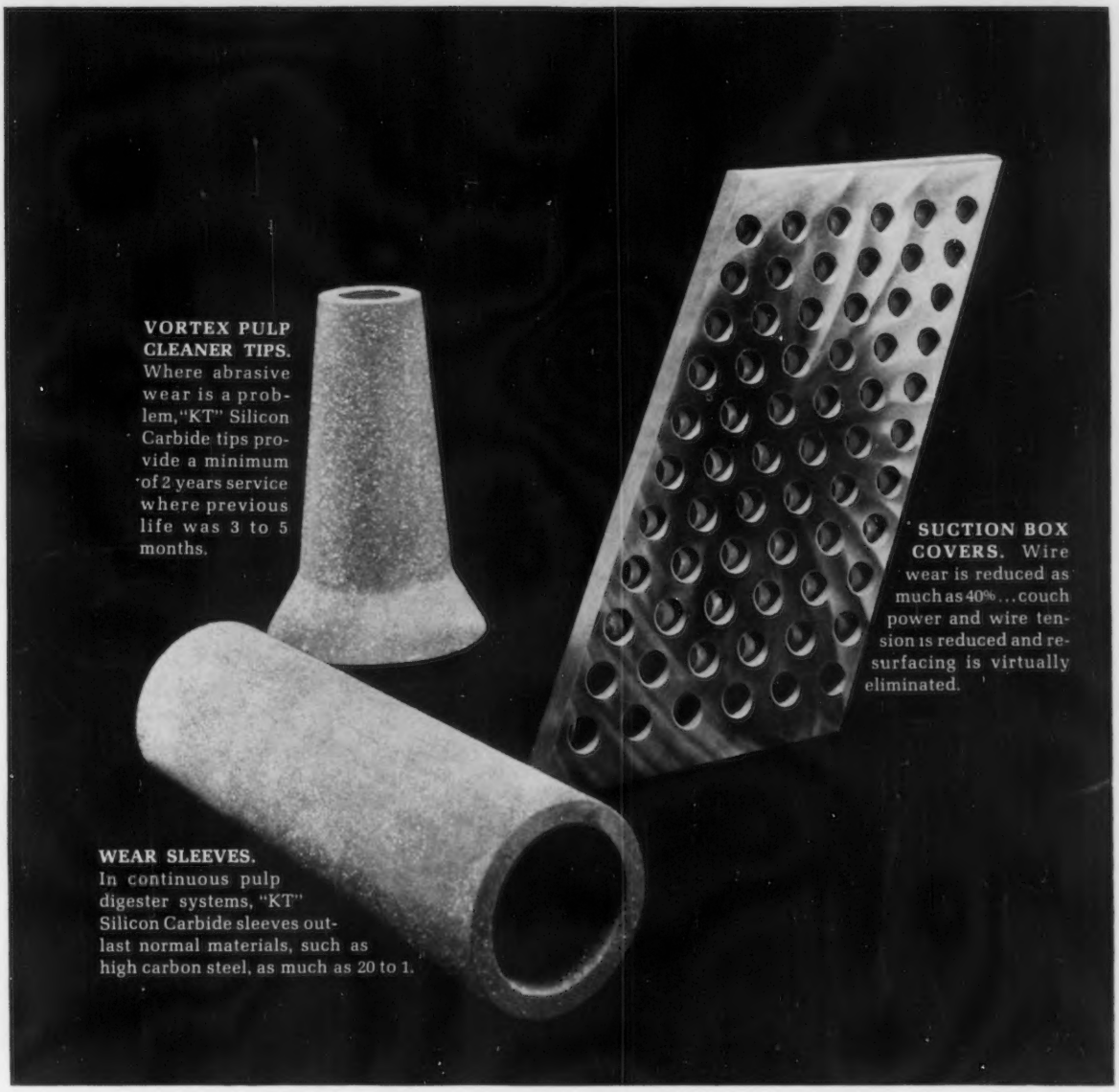
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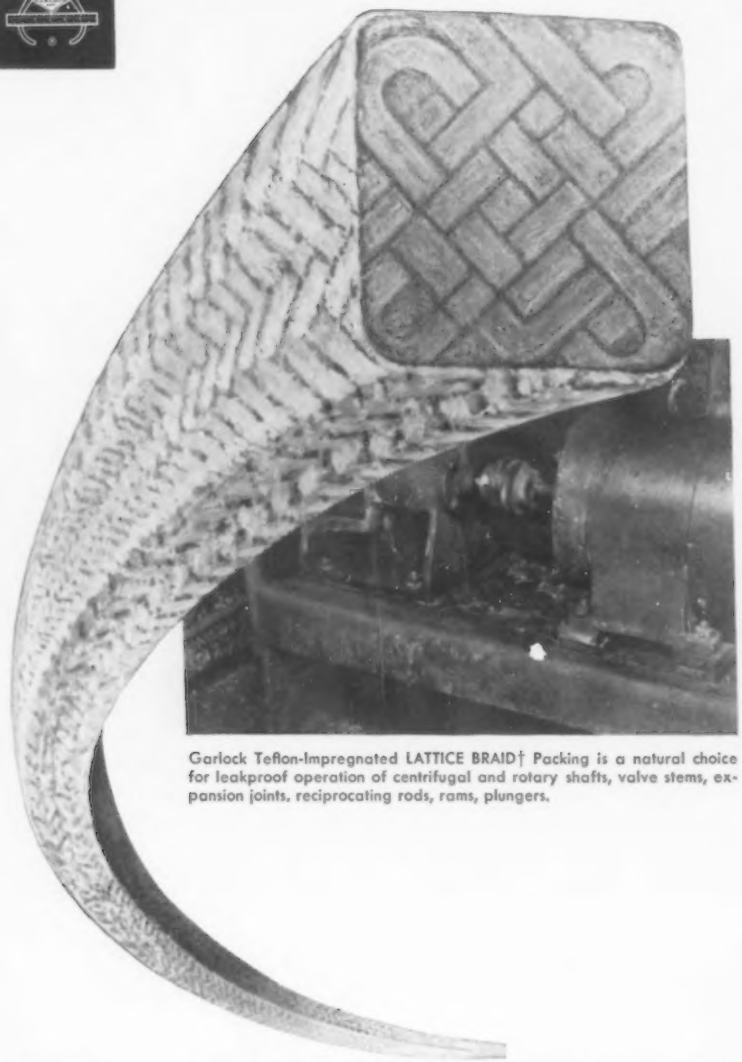

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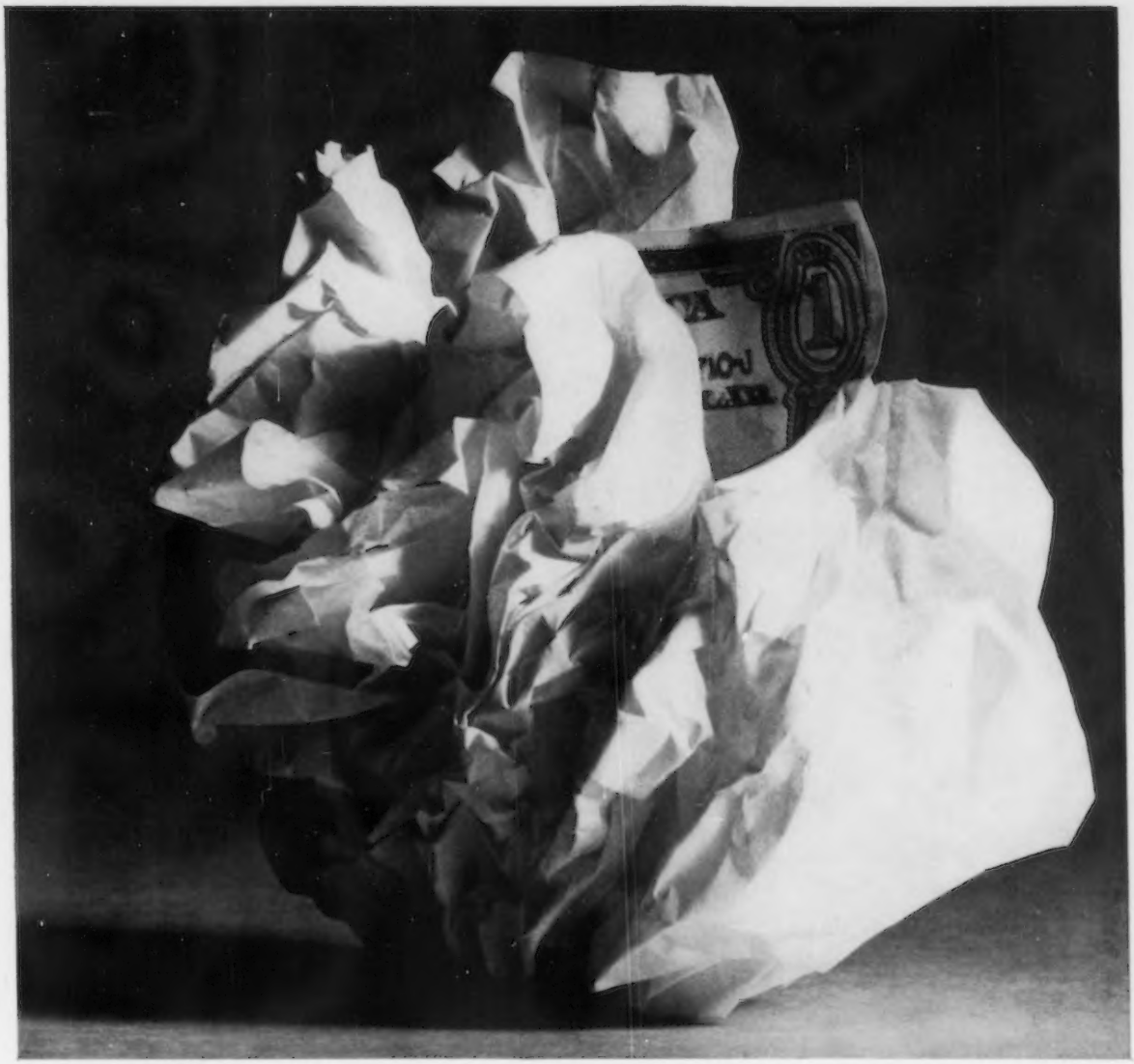

MORE THAN paper is thrown away when the efficiency of the size has not been fully realized. Time and money are also wasted. Don't let your mill face these losses. Consider Cyanamid's high quality rosin sizes—fortified and unfortified, liquid and dry—for dependable, cost-saving performance. And in back of Cyanamid's high quality rosin sizes are those all-important hidden ingredients... Cyanamid's extensive manufacturing and research facilities, and the skilled personnel who man them. Your Cyanamid salesman, with his technical training and paper-making knowledge, is truly your partner in paper progress. Ask him to give you complete information about Cyanamid's high quality rosin sizes.

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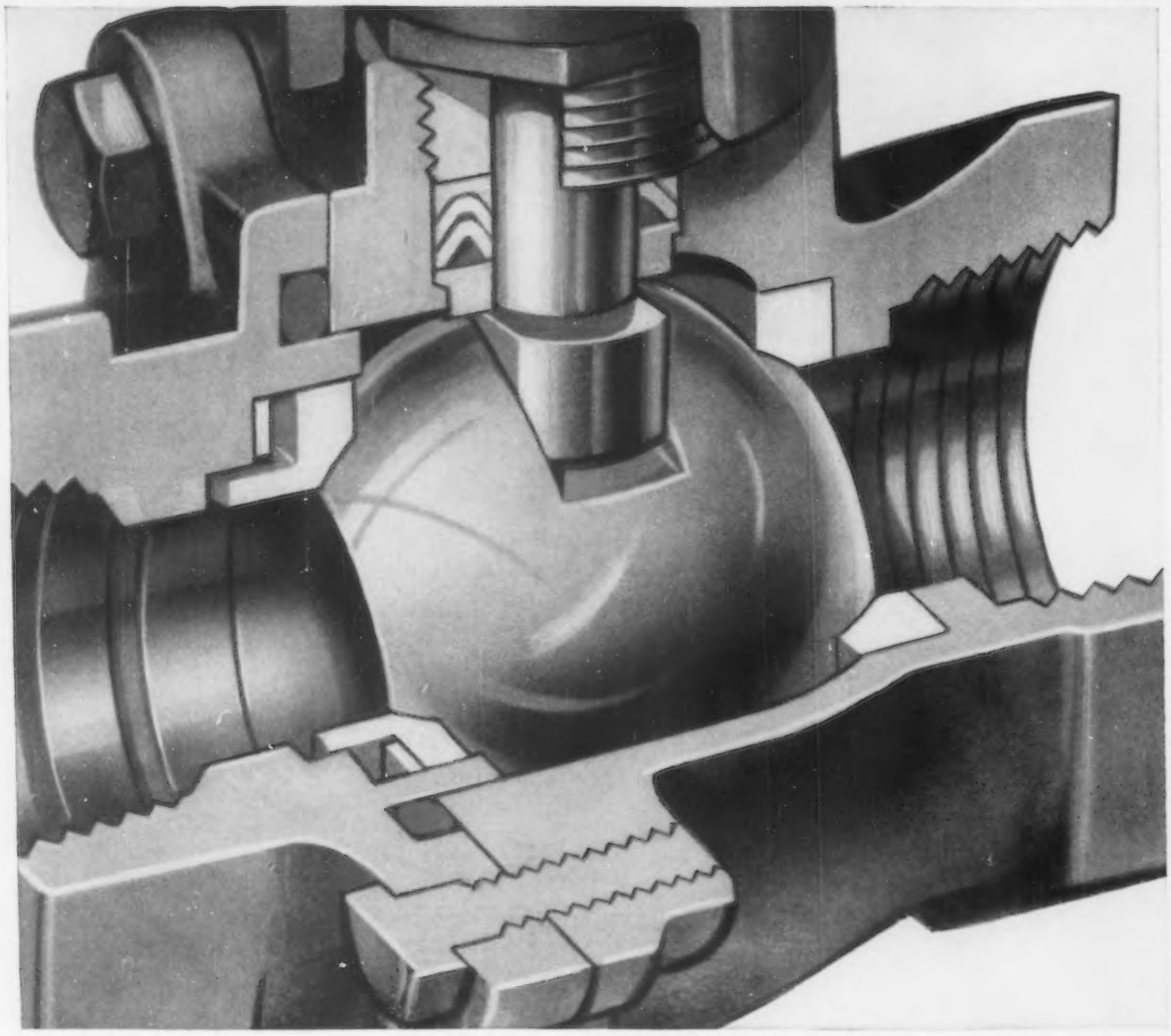
TAKE A CLOSE LOOK AT ROCKWOOD BALL VALVES



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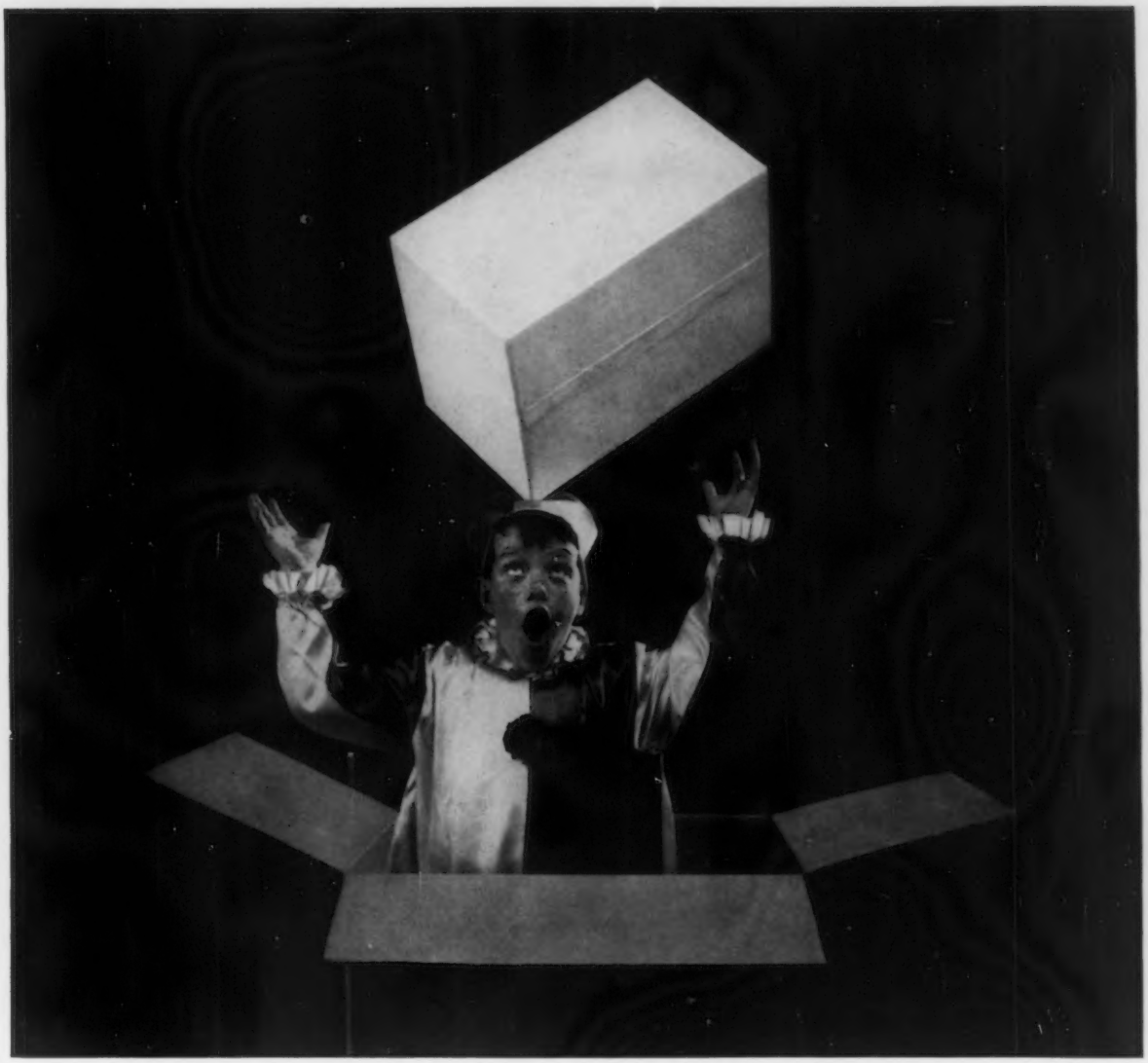

Get the jump on your competition... with boxes brightened by TITANOX®

These white titanium dioxide pigments provide paperboard products with the whiteness, brightness and opacity that help make sales messages and brand names spring out to catch the buyer's eye at the point of sale.

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*Idea submitted by D. E. Coffelt, Southern Chemical Cotton Co., Chattanooga, Tenn.

Old Fort Henry, Kingston, Ontario, Can. — Built in 1812 Photo: Courtesy Ontario-St. Lawrence Development Commission

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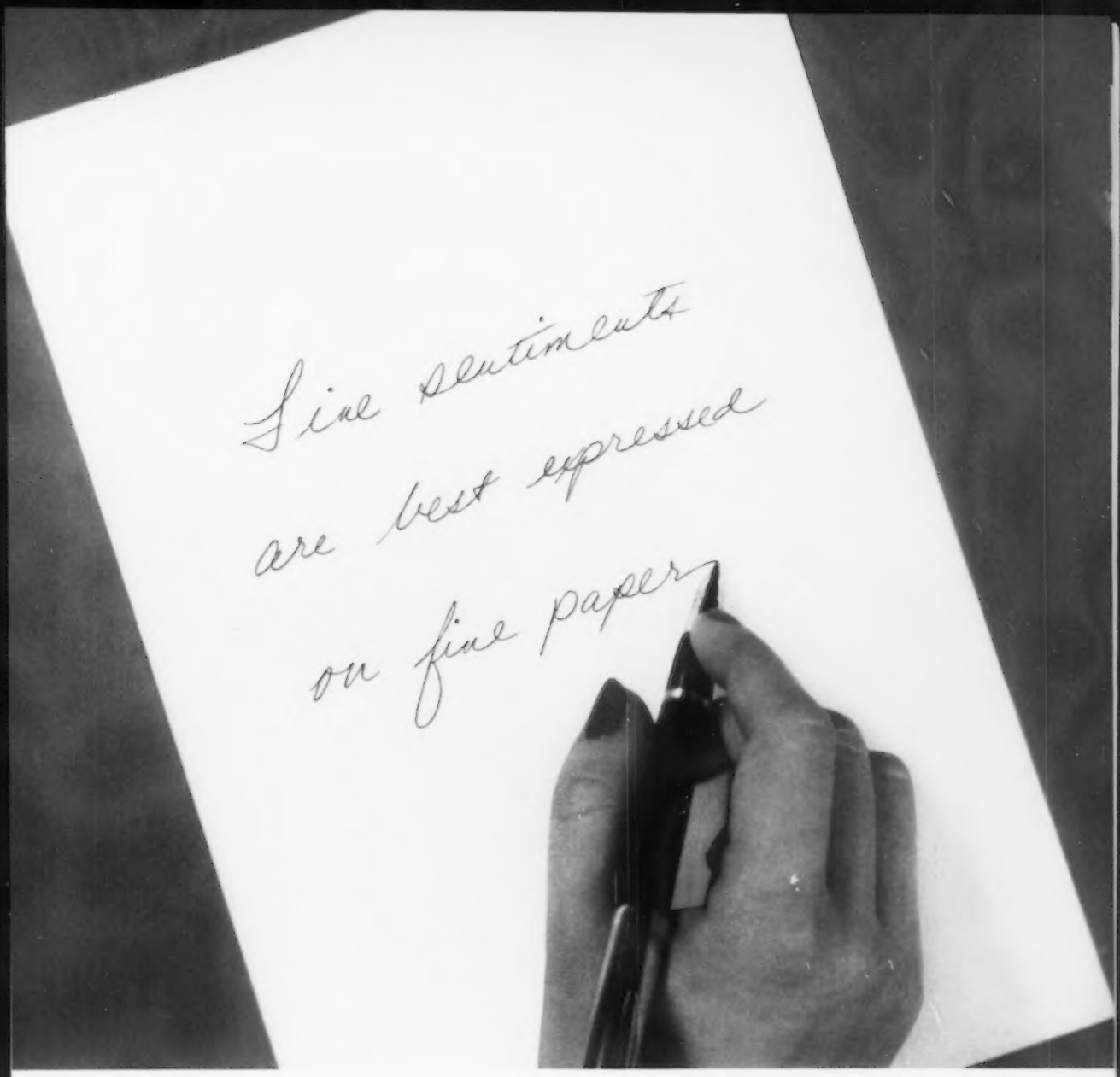

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MANUFACTURERS OF SPECIAL PAPERS PLAIN AND DECORATED

SHAWANO WISCONSIN

September 8, 1961

Mr. R. A. Peterson, President
Valley Iron Works Corporation
Appleton, Wisconsin

Dear Mr. Peterson:

We want you to know how delighted we are with our No. 2 Yankee Fourdrinier Paper Machine. The installation of the new VALLEY Fourdrinier Section and the VALLEY modifications to the press section complete the modernization program that we have had in progress on this machine for several years. Every bit of the original machine has been replaced, and as far as we are concerned No. 2 is now a VALLEY Paper Machine. We are as pleased with the equipment installed this year as we were with your air loaded stock entrance equipment that we installed last year, and that's saying a lot.

We had saleable paper on the reel in less than thirty minutes after putting stock on the wire, and in less than ten minutes after letting down the pickup roll. We passed previous quality and production marks in the first eight hours of operation, and the continuing improvement in both quality and production since then has been extremely satisfying.

We feel that this equipment is second to none, but that is only part of the story. The service and cooperation that you have given us from the idea stage right through the present time has been truly outstanding. Everyone here at Shawano Paper Mills joins me in saying that it's been a pleasure doing business with all of you.

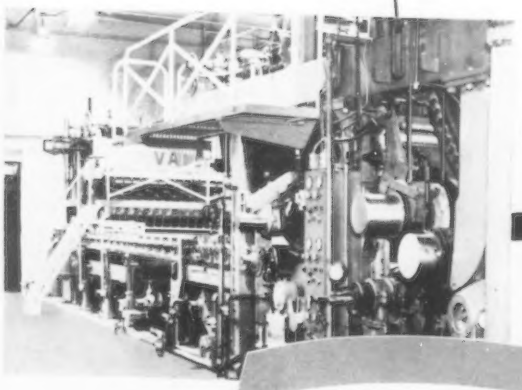
Sincerely yours

SHAWANO PAPER MILLS

Bob Leaf

Robert L. Leaf, Jr.
Vice President

RLL:DA



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ICI

Maintenance of

Pulp and Paper Mill Equipment

The forty-three sections of this book represent the first effort anywhere to publish in one volume comprehensive coverage of the maintenance of most major equipment used by our industry. Each section deals with the problems of a specific type of equipment such as drum barkers, jordans, vacuum pumps, etc. The book, therefore, presents a completely different and more concrete approach than our previous publication (still available) "Pulp, Paper and Board Mill Maintenance" where the subject was discussed in the more general terms of: organization, planning, lubrication, and the specialized problems of each operating department.

Principal machinery covered in *"Maintenance of Pulp and Paper Mill Equipment"* includes:

Drum Barkers
Chain Conveyors
Chippers
Chipper Knives
Vibratory Screens
Magazine Grinders
Ring Grinders
Pulpstones
Grinder Motors
Reject Refiners
Kraft Digesters
Black Liquor Evaporators
Precipitators
Lime Kilns
Conveyor Belts
Screw Conveyors
Bleach Plants
Stock Pumps
Disk Refiners
Jordans
Conical Refiners
Centrifugal Pumps
Chemical Pumps
Vacuum Pumps
Centrifugal Screens
Paper Machine Screens
Fourdriniers
Rubber Rolls
Doctors
Paper Machine Drives
Ventilation Systems
Size Presses
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Trimmers
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Air Compressors
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Trends

Paper Holds Rise, Board Continues Records

Paper and paperboard mill operating rates in November were approximately 83% and 95% respectively, up 1% and 9% from a year ago.

What IS the Trend in Coating?

Is there a present reversal in the earlier strong trend to on-machine coating? Our survey of experts provides a qualified yes to this question. See page 34 for a report on this study.

Pulp Imports Remain Steady

U. S. woodpulp imports in September were very close to the same month last year. For the first nine months pulp imports were almost identical to those in the same period in 1960. The pattern, commented on earlier, of continuing decline in imports from Europe with compensating increase from Canada continues. Imports from Europe were off 31% for the nine month period while those from Canada were up 6% so that the latter supplies 90% of this country's pulp imports. Study of imports by grades notably shows continued heavy decline in all imports of unbleached kraft, and strong upswing in unbleached sulphite and unbleached groundwood from Canada.

Canadian Pulp Output and Export Still Gaining

Canadian total wood pulp output in October was 5% above the same month in 1960, while pulp exports were up 12%. For the ten month period, pulp production was up 4% and exports of same rose by 10%.

Third Quarter Profits Show Modest Increase

Paper Trade Journal's quarterly survey (beginning on page 47) of paper company earnings shows an upward movement in profits for the third quarter. If anything further is needed this report provides proof that overcapacity is not the cause of our poor earnings record.

Paperboard Barely Ahead in Canada

Paperboard production in Canada in October was 5% higher than in the same month last year. For the Jan.-Oct. period production was only 1% above 1960.

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is achieved by simple and sturdy construction. The slushing rotor is designed for a single operation, namely to bring the fibre into suspension as quickly as possible. There are no built in pumps or refining surfaces, these have to be ordered and erected separately.

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On account of the ingenious design of the rotor, the power consumption has proved very low in the many installations of all sizes and types in operation, e.g. 0,5-0,8 HP tons/day when slushing newsprint broke.

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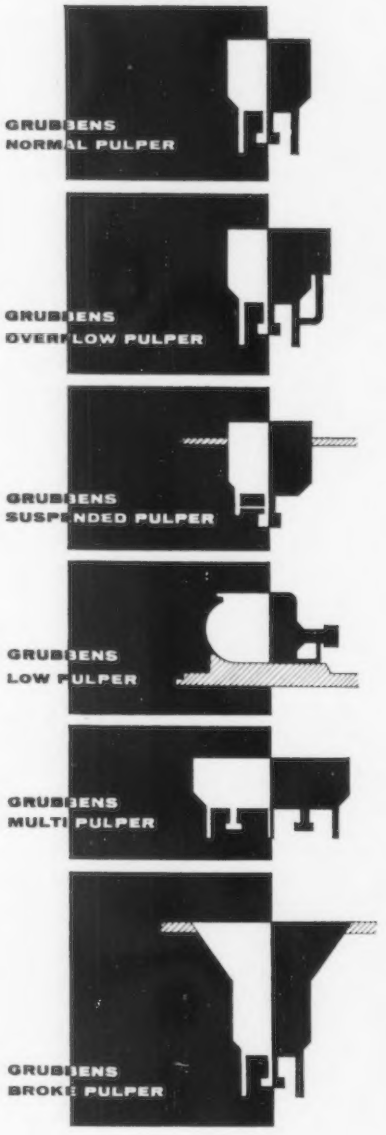
are achieved on account of the simple construction and rationalized production. Delivery times are short.



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in USA, Canada and Mexico who are au fait with the pulp and paper industries of their regions. Mill engineers or agents with such concerns are preferred. Stocks of spare parts must be kept. Our representatives are available in the States end of January 1962 for discussions.

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PULPER

PJT PAPER TRADE JOURNAL

WEEK OF DECEMBER 11, 1961

R. M. Husband

C. R. Calkins

Riegel Paper Establishes Central Research Group at Milford, N.J.

F. S. Leinbach, president of Riegel Paper Corp., has announced the formation of a new Central Research Group for long-range and basic research.

It will be headed by Robert M. Husband who will report to the corporation's director of research and development, C. Richard Calkins.

The group will be located in Riegel's new research facility at Milford, N. J. According to Dr. Calkins, the prime objectives of the new group will be not only research and development in areas of technological importance to the corporation, but a concentration of overall specialized skills to carry out corporate programs in areas less related to immediate interests, and to provide scientific support to the company's divisional technical departments.

Dr. Husband was formerly chief of the chemistry section of Consolidated Paper Corp., Ltd., Canada, where he had wide experience in studies on pulping woods, development work in plastics, synthesis of polymers, organic natural products and fluidized pyrolysis.

U. S. Court Rejects Union Bag Offer To Acquire Doeskin

A $5,662,000 offer by the Union Bag-Camp Paper Corp. to purchase Doeskin Products, Inc., was rejected by Federal Judge Edmund L. Palmieri of the Southern District of New York.

Judge Palmieri, through two court-appointed fiscal agents, has been supervising the corporation's management under an equity receivership since Doeskin stockholders charged mismanagement and misapplication of funds.

On Nov. 10 Judge Palmieri held a public hearing on Union Bag's cash offer of $4,662,000 for the purchase of Doeskin. Opposition was expressed by stockholders and one of the fiscal agents. Union Bag then raised its offer by $1,000,000.

In rejecting the offer, Judge Palmieri said:

"The substantially increased offer of Union Bag does not, in my opinion, impel its acceptance. If Doeskin continues to show the substantial improvement of the recent past, its own private management, not a court-appointed management, should decide its future."

G. N. Orders Complete Off-Machine Coating Line

The Great Northern Paper Co., Millinocket, Me., has awarded a contract to The Black-Clawson Co. for the supply of a complete off-machine coating line, including drying and broke handling equipment. Purchase of this coating line marks Great Northern's entrance into the field of coated publication paper production.

Manufacture of the new coating line will be the joint effort of four divisions of the Black-Clawson Co. Two Flexible coaters, wind ups and unwinds will be manufactured by the Dilts Division in Fulton, N. Y. The drying hoods will be built in Hamilton, Ohio, by the Air Systems Division.

A Hydrapulper with Vokes Rotor will be produced by the Shartle Division, Middletown, Ohio, and an "Autoflyte" reel, eight 60-inch dryer cans and enclosed gears will be furnished by the Paper Machine Division in Watertown, N. Y.

The new unit will produce a two-side blade coated sheet in web widths up to 150 inches at speeds up to 3500 f.p.m. A special feature of the installation is the inclusion in the equipment package of a broke handling and repulping system.

No New Mill For Warren

In view of reports which have been incorrectly published about "a new paper mill" and "increased capacity" at S. D. Warren Co.'s Muskegon, Mich., operation, it seems desirable to set the record straight.

A new paper mill is *not* to be constructed. New productive capacity is *not* to be added at this time.

Rather — improvements will be made on the existing *pulp* mill at Muskegon, and along with this will go some expansion in *pulp* capacity.

PAPER PEOPLE

Waitt Elected V.P. By Spaulding Fibre

Elmer R. Waitt, division manager of Spaulding Fibre Co., Inc., has been elected a vice president of the company.

Mr. Waitt started work for the company in July 1933 in various phases of production, office and testing at the Milton plant.

In January 1942, he was transferred to North Rochester as superintendent of the fiberboard mill. After the mill was destroyed by fire in October 1944, he assisted in the design and construction of the new North Rochester mill which is one of the most modern of its type in the world.

In May 1954, Mr. Waitt was appointed assistant division manager, and in August 1956, became manager of the Spaulding plants at Dover, Milton and North Rochester.

St. Regis Chooses Smith To Manage Tacoma Mill

St. Regis Paper Co. has named Denholm Smith as resident manager of its kraft pulp and paper mill at Tacoma, Wash. He fills a position made vacant several months ago when S. Kepple Pratt was named manager of all of the company's kraft pulp and paper manufacturing operations.

Mr. Smith served most recently as assistant resident manager and pulp mill superintendent at the Hinton, Alberta, mill of North Western Pulp and Power, Ltd., in which St. Regis holds a substantial interest. He went to Hinton from St. Regis' Pensacola, Fla., mill in 1957 when the Alberta pulp mill commenced operations.

Massillon Paper Announces Executive Changes

Massillon Paper Co., Massillon, Ohio, has announced a change in officers.

Herbert Marks is now president and treasurer; Fred H. Shew, executive vice president and general manager; and William R. Shew, secretary and sales manager.

R. R. Chase

Union Bag-Camp Fills Newly Created Post

Union Bag-Camp Paper Corp., has announced the appointment of Richard R. Chase to the newly created post of director, sales technical services. He will headquarter in the company's New York office.

A member of the Union organization since 1948, Mr. Chase served most recently as assistant manager, technical division, at the Savannah plant. In his new capacity, all of the company's various sales technical services will be consolidated and centralized into one department under his direction.

Comette, Newman & Rust Step Up at Ontario Paper

Ontario Paper Co., Ltd., Thorold, Ont., has appointed Romeo Comette assistant vice president — manufacturing. Charles A. Newman will succeed Mr. Comette as division manager at Thorold and Thomas Rust will replace Mr. Newman as mill division manager of the Quebec North Shore Paper Co. at Baie Comeau, Que.

Mr. Comette has served with Ontario Paper and its affiliated company, the Quebec North Shore Paper Co., since 1936. A native of St. Alexandre, Quebec, he is a graduate of the University of Montreal, and has spent almost his entire career in the pulp and paper industry.

A native of St. Catharines, Mr. Newman was graduated from Tri-State College in Angola, Ind., and joined Ontario Paper in 1936. He went to Baie Comeau in 1938 to serve with the Quebec North Shore Paper Co., returning in 1950 to Thorold as groundwood superintendent and has been division manager there since 1956.

Mr. Rust has served at Baie Comeau since 1951, and before that spent four years at the Thorold mill. He is a graduate of Queen's University, Kingston, obtaining a B.S. in chemical engineering in 1942.

All three appointments are effective January 1.

Hagans Joins Hudson Palatka Mill

Rodney H. Hagans has been appointed to the position of industrial engineer for Hudson's Palatka mill.

Mr. Hagans, a native of Alabama, has a degree in business administration from the University of Alabama. He joins Hudson after many years with Bayuk Cigars, Inc., Selma, Ala., most recently as plant superintendent.

Weyerhaeuser Names Pulp Sales Rep for East

Weyerhaeuser Co., Pulp and Paperboard Division, has appointed Horace L. Smith, III, as district representative for pulp sales in the east with headquarters at 230 Park Ave., New York. In his new capacity, Mr. Smith will report to Spencer M. Smith, manager, pulp sales.

Mr. Smith has been sales representative for Standard Paper Manufacturing Co. in the southeast, south and southwest. He joined Standard in 1953.

A graduate of Washington and Lee University with a B.S. degree in business administration, Mr. Smith is a native of Richmond, Va. He was an officer in the Army for four years during World War II and was recalled for two years duty during the Korean War.

New Project Engineer for Scott Detroit Mill

Scott Paper Co.'s staff engineering department has announced the promotion of Robert A. Maier to the position of project engineer in the engineering department of the Scott Detroit, Mich., mill.

Mr. Maier joined Scott in 1960 as an engineer in the staff engineering department, and has continued in that position until the present time.

C-Z Advances Frazer To New Post

Ed Frazer, technical assistant to the superintendent of paper machine-tissue at Crown Zellerbach's Camas, Wash., mill, has been promoted.

Mr. Frazer has been named industrial engineer, at Gaylord Division Headquarters, San Francisco. The engineer came to Camas two years ago after serving at the San Leandro and Antioch divisions.

O-I Fills Five Top Posts In Forest Products Div.

Appointments to the five top positions in the production department of the recently formed Forest Products Division of Owens-Illinois have been announced. They are: K. M. Cherry, production manager, paper mills; William R. Winters, manager, board scheduling and purchasing; William F. Connelly, production manager, corrugating plants; Pete L. Chism, manager multiwall bag plant, and Fred Janz, manager of engineering and maintenance for corrugating plants.

Messrs. Cherry, Winters and Connelly will be located in Toledo, Ohio; Mr. Chism at the division's Valdosta, Ga., plant, and Mr. Janz at O-I's Jacksonville, Fla., corrugated box plant.

Mr. Cherry, joined O-I at its Tomahawk, Wis., mill in 1947 and was mill manager when he moved to Toledo in 1957 as the manager of linerboard mills. He has been in charge of mill manufacturing for the company's five mills since 1959.

Mr. Winters has been in charge of board scheduling and purchasing since 1958 and will continue in that position in the new division. He joined O-I at its glass container plant in 1940. He transferred to Toledo and the paper phase of the business in 1948.

Mr. Connelly has been production manager at the division's corrugated box plant in Salisbury, N. C., for the past two years. From 1950 to 1958 he served as an industrial engineer at glass container plants in Alton, Ill., and Charleston, W. Va., and in the Toledo general office. For a year before going to Salisbury, he was assistant to the manager of the company's former Multiwall Bag Division.

Mr. Chism has served as manager of the Valdosta multiwall bag plant for the past four years. From 1942 until 1957 he worked in various departments of O-I's Alton plant.

Mr. Janz has been chief of engineering in O-I's (formerly National Container Corp.) corrugated box plants for the past 22 years.

Paper and Paperboard Production

The American Paper and Pulp Association reported the ratio of the United States paper production to mill capacity for the holiday week ending November 25, 1961, at 88.4 per cent, compared with 94.3 per cent, revised, for the preceding week. The ratio was 86.7 per cent for the corresponding week a year ago.

The National Paperboard Association reported the paperboard production ratio for the holiday week ending November 25, 1961, at 93 per cent, compared with 97 per cent for the preceding week and 81 per cent for the corresponding week a year ago.

(Detailed Statistics on page 66)

Tomczak Retires as Plant Engineer at Flambeau

S. E. Tomczak, plant engineer at Flambeau Paper Co., retired on December 1. Mr. Tomczak was born December 8, 1888, at Stevens Point, Wis., and first started working for a predecessor company in its Ashland sulphite mill in 1902 and moved to the Park Falls, Wis., plant in 1920 as superintendent. He was appointed plant engineer in 1941. His son, J. H. Tomczak, is Flambeau's purchasing agent.

Another recent retirement at Flambeau is that of Cliff Wells, power superintendent since 1936. Mr. Wells first joined the company in 1910.

Columbia Specialties Names Mfg. Manager

Columbia Specialties, wholly owned subsidiary of Columbia Box Board Mills, Inc., of Chatham, N. Y., has appointed William F. Wanner manufacturing manager.

Mr. Wanner, who resides in Teaneck, N. J., has had many years of experience in the paperboard field; having spent many years with the Continental Paper Co., Ridgefield Park, N. J.

In his new capacity, Mr. Wanner will be in charge of all manufacturing in the new plant which is now being constructed on property adjoining the Columbia Box Board Mills on Route 295.

Garner Advances to Sales Manager at Wausau

Ronald J. Garner has been promoted to the position of mill sales manager of Wausau Paper Mills Co., Brokaw, Wis.

As mill sales manager, Mr. Garner is responsible for customer service, liaison between Wausau's sales department and the mill production scheduling and dispatch departments, and for the operation of the sales order department.

C-Z Names Norris Project Engineer at Camas

Crown Zellerbach has named James R. Norris project engineer at its Camas, Wash., mill.

Mr. Norris came to Camas from the Port Townsend division where he was senior engineer. He joined C-Z in 1951 after spending several years in the field of machine design.

OBITUARIES

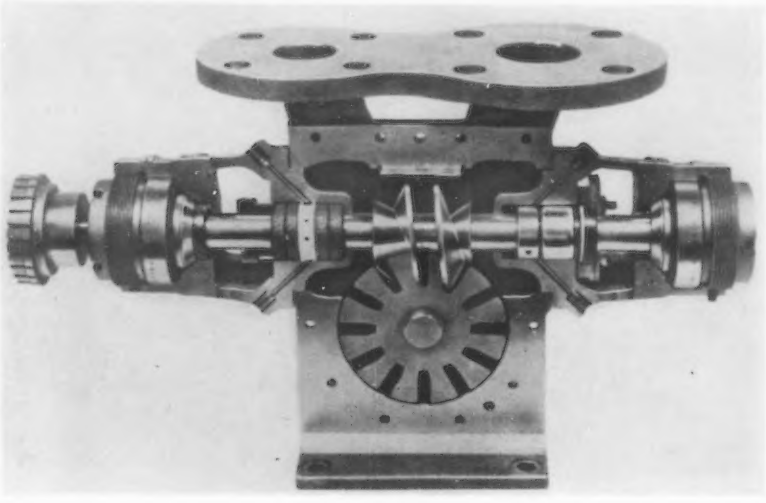
Clyde C. Tiffany, III, 29, of Park Falls, Wis., was killed November 26 when his car left highway 86 on a curve two miles east of Park Falls, struck a culvert and overturned. He was a chemist for the Flambeau Paper Co.

Herbert H. Watson, 73, until his retirement, consultant papermaker to the Reed Paper Group, died on November 19 after a short illness.

Mr. Watson began his career with Fisher and Co. at Tamworth and in 1913 joined The Imperial Paper Mills, Ltd., at Gravesend, rising to be machine foreman. He moved to Reed as mill superintendent in 1921 and commenced the work of creating Aylesford Paper Mills, working in close association with Lt. Col. C. D. Sheldon and Harry Smart.

In 1954 Mr. Watson relinquished his direct responsibilities at Aylesford Paper Mills and became consultant papermaker to the Reed Paper Group. For a number of years, until his retirement at the end of March this year, he was an alternate for E. M. Little on the Reed board of directors.

NEW EQUIPMENT & SUPPLIES



Pump Incorporates Archimedes Screw Principle

A newly-engineered positive displacement pump, designed for a wide variety of applications in the chemical process industries, has been introduced by Goodyear Pumps Inc., 9 Rockefeller Plaza, New York 20, N. Y. Said to handle such products as emulsions, foaming liquids, abrasive slurries, pulp slurries, and thixotropic products, the unit is available in capacities up to 230 g.p.m., develops pressure of 100 p.s.i., and lifts up to 30 feet of water.

Operating on the classic Archimedean principle, the Goodyear pump contains only two moving parts, a stainless worm or rotor meshing with an elastomer edged spur gear—the wiper wheel. The elastomer, selected for specific applications, acts as a seal and a squeege on the rotor blades, creating the suction lift and pressure.

The Goodyear pump is engineered primarily for applications where turbulence and shear must be kept to a minimum, provides an axial flow of material without rotary motion of the product. Design of the Goodyear pump is said to also provide pulseless flow, allow uninterrupted movement of product in continuous processes, to delicate instrumentation, or to filling equipment.

The unit is designed to reduce maintenance and downtime to a minimum. Simple removal of the pump casing cover permits immediate inspection or replacement of the rotating element if necessary. Stocking of the spare rotating element affords the user the equivalent of a spare pump, while avoiding the production delays caused by pump replacement.

Single-Ply Conveyor Belt Does Work of Seven

United States Rubber Co. has announced a conveyor belt which it describes as representing the greatest advance in conveyor belt design since textiles were first used in this product.

Called UsFlex, the belting is claimed to be stronger than conventionally-designed belting, but is only half as thick and weighs only as much. It is single-ply construction, but can do the work of ordinary four to seven-ply belting.

Because of its lightness and flexibility, it requires smaller pulleys and less horsepower to operate, and can be run at higher speeds.

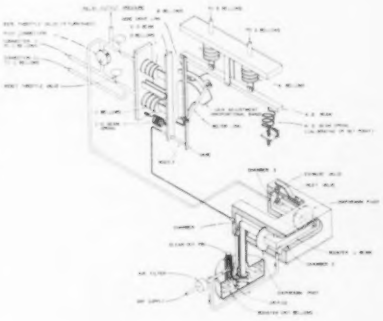
UsFlex belting has many other advantages over ordinary belting. Tough, high-tenacity, synthetic carcass is mildew-proof and acid resistant. The cover and carcass are inseparably bonded. Its single-ply carcass eliminates possibility of ply separation.

The fabric in UsFlex belting is woven in a straight plane, the warp and fill locked in place by specially-designed, high tension binders. Straight crossribs provide sufficient transverse rigidity to prevent spillage, while allowing easy flexing around pulleys. The type of construction is said to increase impact resistance and reduces the possibility of tearing.

Analog Computer Also Controls Flow, Pressure & Temp. Systems

A pneumatic analog computer that performs control functions as well as complex mathematical operations is now available from Bailey Meter Co., 1050 Ivanhoe Road, Cleveland 10, Ohio. Designated the Bailey Pneumatic Analog Computer and Mini-Line Controller, the unit is designed for use in pneumatic computing-control systems for flow, pressure, temperature, etc.

As an analog computer, the Bailey unit can add, subtract, multiply, divide, average, integrate, and take the first and second derivative. By combining a number of the analog



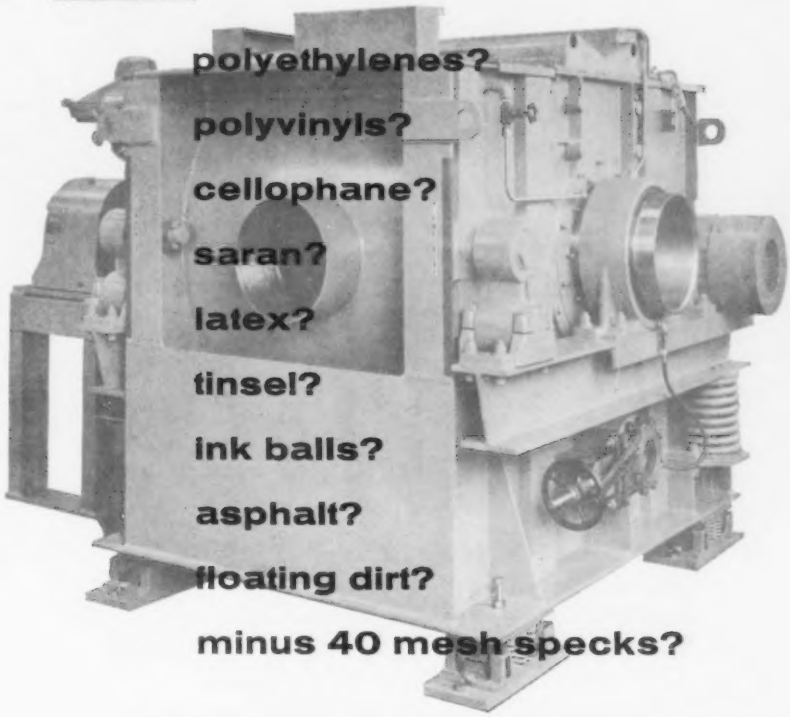
computers, more complex calculations, such as squaring, extracting square root, and ratioing, can be performed.

As a controller, the analog unit provides the following control actions; proportional; proportional plus reset; proportional plus rate; proportional plus reset plus rate; and floating (reset only).

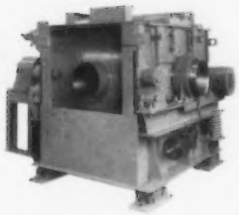
Some operating characteristics include: Pneumatic signal range of the unit is available for either 3-15 or 3-27 p.s.i.g.; Gain and set point adjustments may be made manually, remote manually, or automatically; Gain may also be characterized through a shaped cam when this fea-

What do you

WANT OUT



BIRD VIBROTOR SCREENS



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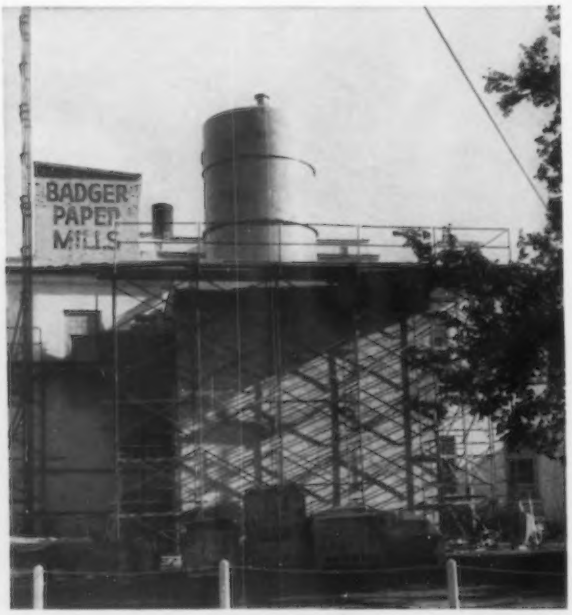
INSTALLS NEW IMPCO CHLORINATION TOWER

Badger Paper Mills, Inc., Peshtigo, Wisconsin, manufactures fine bleached sulphite papers. They recently installed this chlorination tower which was steel fabricated, rubber-lined, pressure-vulcanized and shipped from Nashua, N. H., in one piece. This tower, 44 feet in length and 11'-6" in diameter is one of many rubber-lined vessels built completely by Impco and lined with Impco compounded rubber. This autoclave vulcanizing method eliminates troubles often experienced with "on location" lining and curing of rubber.



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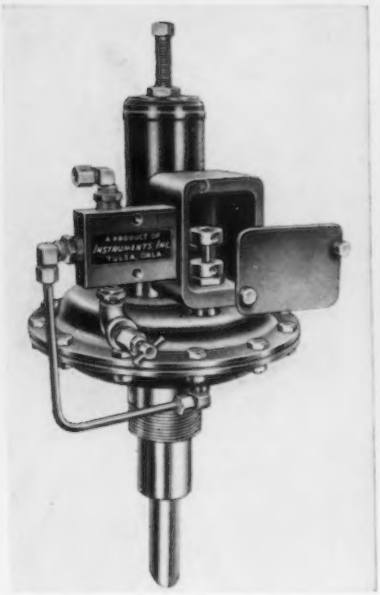

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ture is required for pressure and/or temperature compensation, etc.; at a gain setting of 1, a change in the input will be reflected in the output within ±0.10 p.s.i. and at a gain of two, output pressure will repeat within ±0.05 p.s.i. when the input has been changed and restored to the original value; the analog computer has a frequency response of approximately two c.p.s. depending on the capacitance into which it works and reset action is 0 to 300 repeats per minute.

Asphaltic Resin Useful in Molded Paper Products

A high-density asphaltic resin material, Sun Monor, is now available in commercial quantities from Sun Oil Company's Toledo, Ohio, refinery.

This modified asphalt is already being used in, among other products, molded paper products such as weatherproof paper and bags, wallboard, insulating paper, boxes, and laminated paper.

Some typical properties of the ma-

(Continued on page 70)

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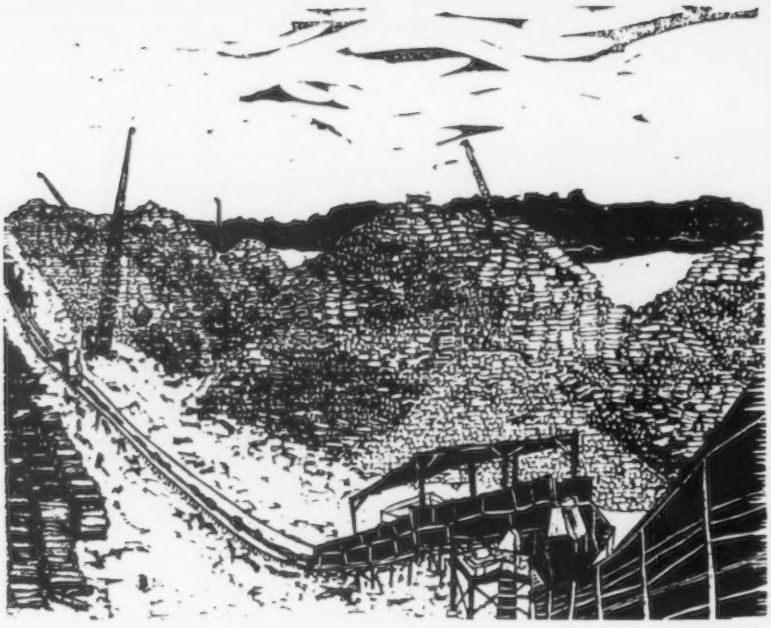
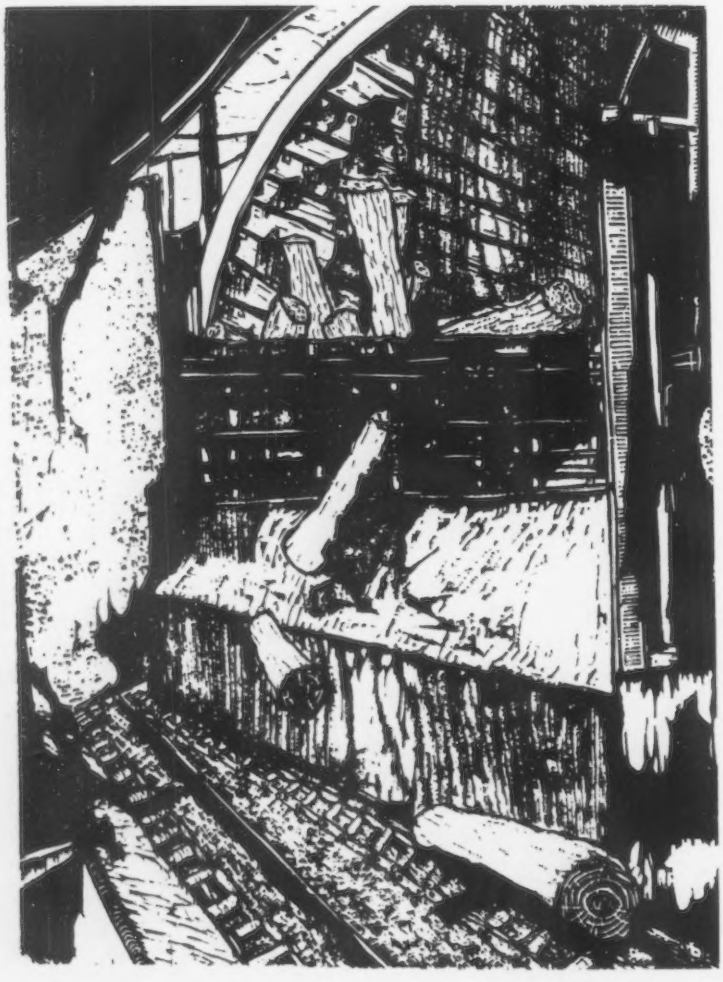
Art in Industry



▲ WOODYARD



◀ BARKING DRUM

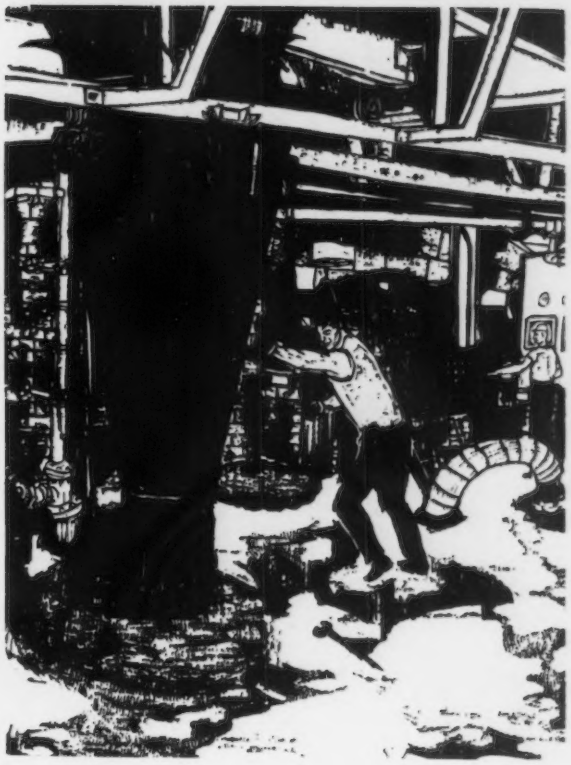
Presented here are reproductions of five (of a projected series of six) dramatic woodcuts depicting various phases of pulp and paper manufacture. Scott Paper Company's Hollingsworth & Whitney sales division commissioned Ted Davies, xylographic expert of New York City, to do these scenes.

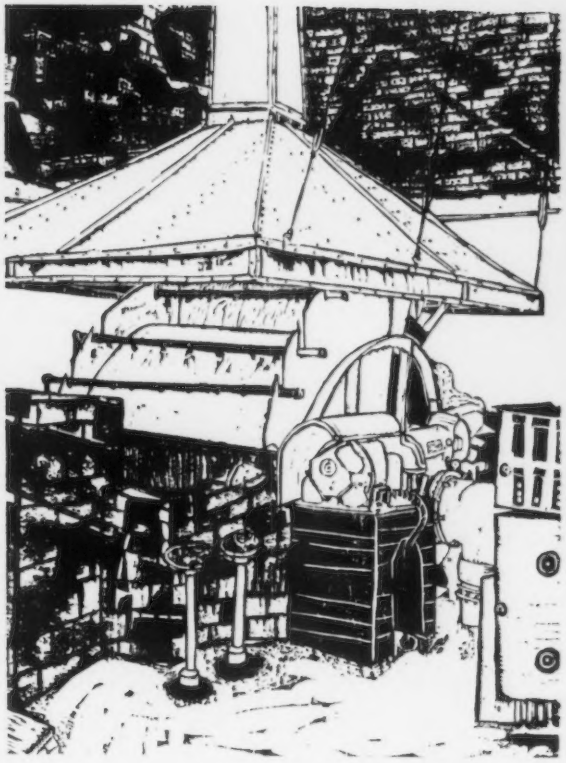
The woodcuts pictured here show, w o o d conveying, barking, pulping, bleaching and papermaking operations at Scott's Mobile, Alabama plant. Shown here in black and white, the original woodcuts are even more effective because they have been printed in color.

Mr. Davies' designs are printed on different grades of H&W paper for use as inserts in various printing trade media. The woodcut series serves as a practical vehicle for emphasizing the durability and printing qualities of H&W papers.

Scott Paper is to be congratulated for its use of "authentic" original art in this sales promotion and advertising program.

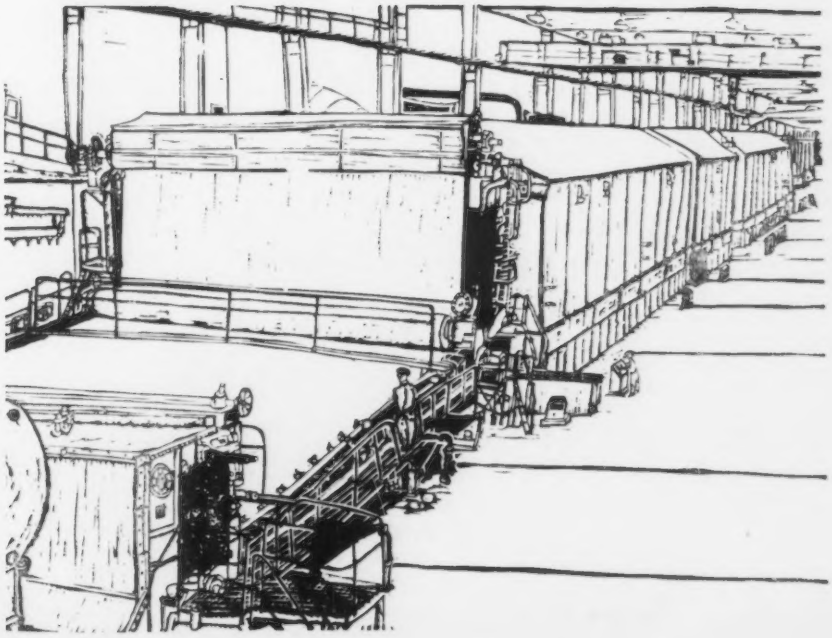
PULP DIGESTER ▶





◀ PULP BLEACHING

WET END ▶



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web control NEWS

Volume 1 Number 5

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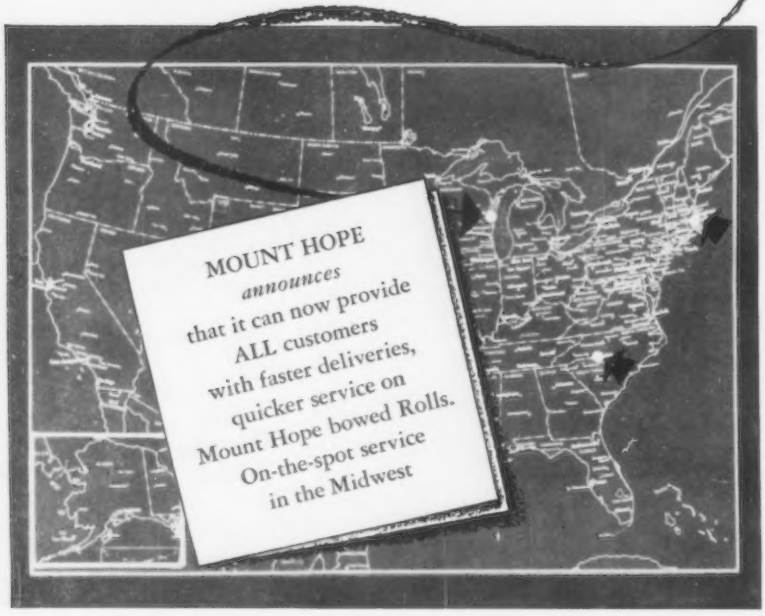

APPLETON, Wisc., Dec. 1, 1961— Mount Hope Machinery Company, Taunton, Mass., recently made its first shipment of Mount Hope bowed Rolls from its new plant in Appleton which began operations early this month. The new plant, under the direction of Orville J. Wilson, will offer "better and faster local delivery in the heart of one of the most important pulp and paper sections of the country," according to Mount Hope President J. Douglas Robertson. The company now has plants in Taunton, Mass. and Charlotte, N.C. as well as Appleton.

JIM GINTER, Mount Hope's sales engineer for Northern Illinois, Western Michigan, Wisconsin, Iowa and Minnesota, will move his office from Chicago to the Appleton plant, providing on-the-spot sales and service.

BOB NITZA, whose headquarters is Lakewood, Ohio, will also be able to provide faster service in his territory which includes Kentucky, Ohio, Indiana, Missouri, Illinois and Eastern Michigan.

COMPANY ALSO ANNOUNCES DESIGN AND SIZE IMPROVEMENTS IN MOUNT HOPE BOWED ROLL

Two new sizes of fixed-bow Mount Hope bowed Rolls are being added to the company's line. The new 3"-diameter roll is a substantial improvement on an existing unit of the same size. The 5⅛"-diameter Roll was developed in response to customer demands for a unit between 4¼" and 6¼" Rolls. In addition, Mount Hope has announced design improvements of the 4¼" model.

The new 3"-diameter Roll will be of Mount Hope's standard construction. This eliminates Mount Hope's only bushing-type Roll and provides appreciably better freedom in turning and substantially greater speeds. The unit is provided with either plain or sealed ends depending upon type of service. It is anticipated that the new Roll will see most of its service on paper, film and foil converting and printing machines.

This Roll uses the same bracket as the present 4¼"-diameter Roll, providing interchangeability and simplicity of mounting and adjusting. The new Roll also incorporates several new design features, including an improved seal. These improvements are also incorporated into Mount Hope's present 4¼" unit.

The 5⅛"-diameter Mount Hope bowed Roll will fill what Mount Hope has found to be a gap between 4¼" and 6¼" Rolls. It will make it possible for a customer to purchase a less expensive and smaller Roll for jobs which previously would have required a 6¼" Roll to meet tension, speed and precision requirements. The new Mount Hope bowed Roll will come with a complete line of sheaves and brackets similar to those of the 6¼" Roll. Mount Hope bowed Rolls are manufactured in sizes ranging from ⅞" to 10½" outside diameter with face lengths up to 372". When larger Rolls are needed, Mount Hope will make them.

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- Precision Guiders
- Light Duty Wind & Unwind Stands

The following are Registered Trade Marks: Mount Hope; Vari-Bow.

Mount Hope Web Control Equipment MACHINERY COMPANY
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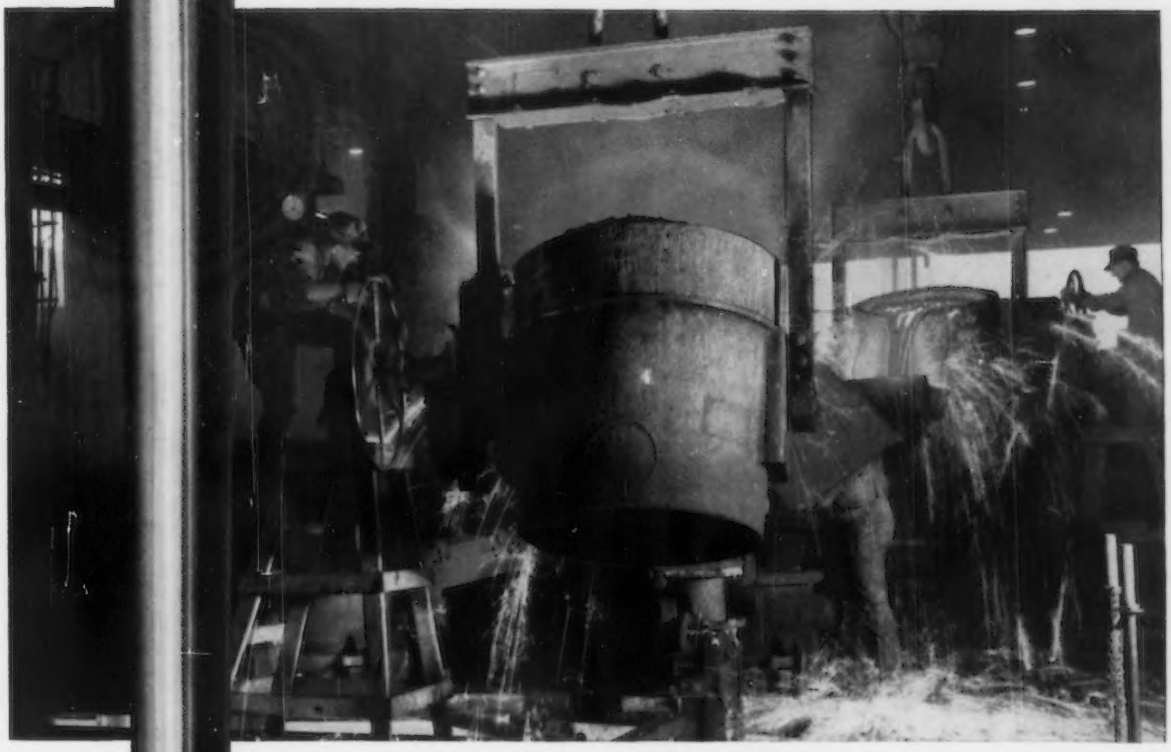

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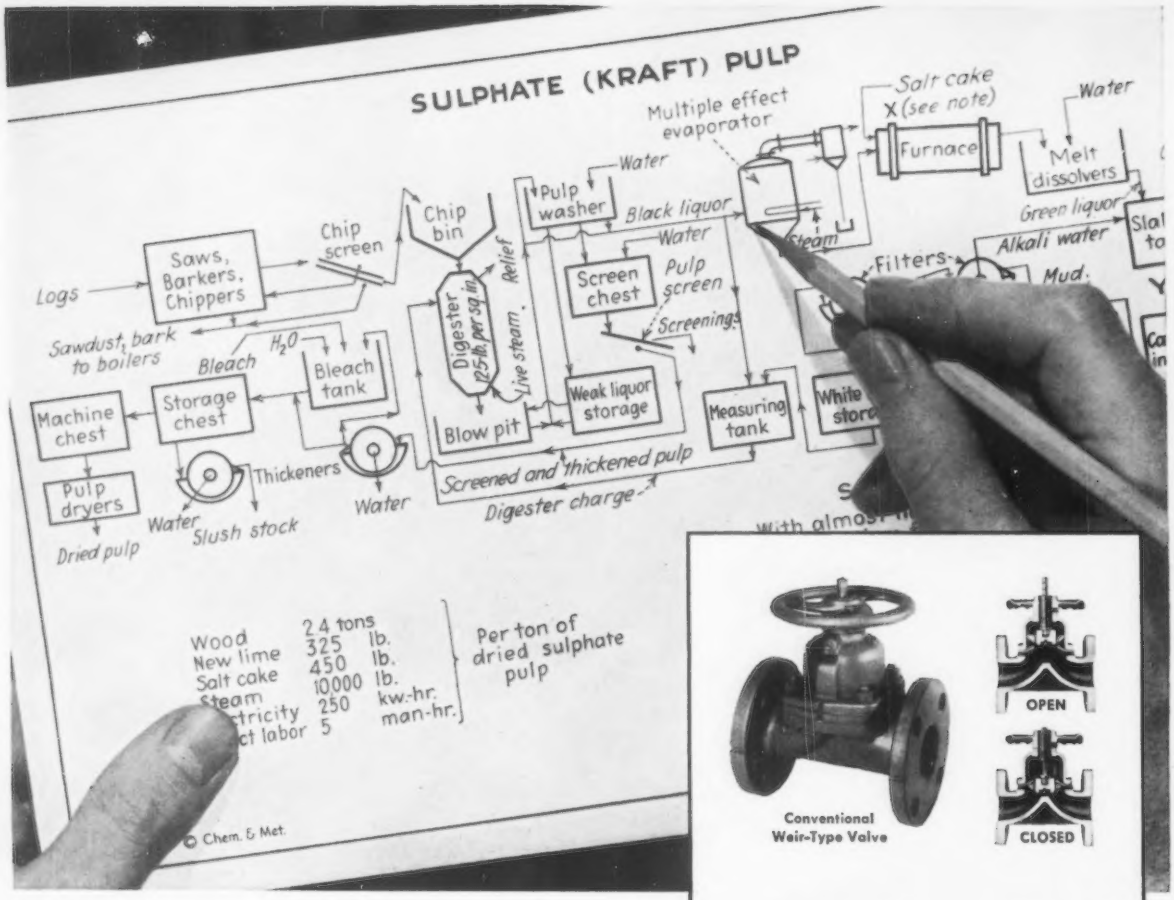

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COATING—On-Machine Vs. Off-Machine

One of the hottest subjects in the paper industry! A panel of experts in this field points to the factors that should be considered before deciding on a new coating installation.

Within the past year or two, the off-machine coater sems to have returned to prominence in the paper industry with a number of installations of this type being announced or recently brought into operation. Is there a trend in this direction? And, if so, why? What are the factors involved in making a decision between on or off machine coating?

These are the questions submitted by the editors of PAPER TRADE JOURNAL to a panel of experts in the coating field. That the answers are not completely clear, even to the experts, is evident from the reply of one mill official, contemplating the installation of a new coater, who states, "At the present time we are trying to decide upon the better route, and have not mustered enough data to make our own decision."

There are many facets to the question of on or off machine coating and Lawrence W. Egan of Frank W. Egan Co. points out, "Primary considerations include the extra handling required in a conversion operation versus the advisability of putting a coating unit in tandem with paper making operations with resultant down time on the paper machine when difficulties are experienced with the coater."

Lawrence W. Egan
—Frank W. Egan Co.

Philip A. Peterson
—Rice Barton Corp.

Emphasis on Blade Coating

In considering trends either toward off-machine or on-macnine coating, the current emphasis on blade coating cannot be ignored. To many people the question, "On or off-machine?" means, "Which location is best for the *blade* coater?" In other words the type of coater is taken for granted. Understandably, Philip A. Peterson, sales manager of Rice Barton Corp., is a prime exponent of this type of thinking. In answer to a question on the trend toward off-machine he said, "Although most of the original trailing blade coater installations on bread wrap are on-machine and all the bleached board coaters put in over the last three years are on-machine, the trend today in publication grades is toward off-machine. This is particularly true as the operating speeds approach 2,500 to 3,000 f.p.m."

In general the results of the survey tended to corroborate Mr. Peterson's statement that there is a definite trend toward off-machine. However, the answer is not always clear cut as each expert warned that in each case where a new coater installation is contemplated it must be studied as a new situation with no hard and fast ground rules.

Space is Major Factor

One of the major factors to be considered is available space. When an entirely new paper mill is being constructed space can be provided quite easily for the paper machine as extended by on-machine coaters. That is, if the grades of paper are suited to on-machine coating. On the other hand, if old paper machines, are being converted or rebuilt, the on-machine coater may well be economically infeasible due to the necessity of moving other departments to provide a longer machine room.

Another consideration pointed up in the survey results was that of experience in the coating field. It appears that many manufacturers of coated paper have already made a decision between on versus off-machine coating, and when installing new units follow past practices. Since each type of coater requires a sometimes lengthy period and large investment to gain operating experience, a changeover to another type is not lightly considered, especially if quality is satisfactory. On this point of quality, the experts felt that the skill of the company was more important than the location of the coater.

Not Entire Agreement

Respondents to the survey were not entirely in agreement as to the trend toward off-machine coaters. Some felt there was a definite trend in this direction for publication papers. Others saw no evidence of this, and pointed to high tonnage grades (including publication papers) as being best suited for on-machine coating. Quite possibly the reason for this apparent disagreement is that those mills requiring considerable flexibility in their coating operations will lean toward the off-machine coater to meet specialized needs. The experts feel that where production centers on a few standard grades with a minimum of changes, the mill will choose an on-machine coater.

Pros and Cons Discussed

That the blade coater (whether on or off machine) has had a tremendous impact in the coating field cannot be denied. Most of the installations being made today are of this type. The reason—the superior printing surface it provides. However, continued expansion of blade coating applications will depend upon its adaptability as a coating tool to meet the great variety of formulations coming out of the research laboratories in a search for new products.

A factor in on-machine coating installations is the effect on paper machine efficiency, with a loss of 1.5 to 2 per cent expected for each coating application. Other factors mentioned in results of the survey were: paper machine adaptability to the coater such as machine speed, type of coater, drying requirements and type of drive; adaptability of the coater as to grades to be coated, per cent of production to be coated, number of customers to be served.

Balanced against the above factors are several items of cost for the off-machine coater, chiefly in labor to operate the machine and to move raw stock from machine to coater. Other factors include: the number of machines to be served, available space, flexibility, and capital investment.

While the above generally summarizes the results of the survey, several replies have been selected for their detailed analysis of this particular phase of coating. These are included on the following pages.

Specialties Need Off-Machine Flexibility

H. A. Hall,
Allied Paper Corp.

The decision between coating on the machine and coating off the machine will depend largely on the type of coating service that a mill performs for its customers. Specialty mills which design coatings for individual customers will be interested in versatility and flexibility. They expect to change orders frequently from one basis weight to another, from one roll size to another, and from one coating formula to another. Their orders are often small in size. An off-machine coater is best suited for this type of mill. In contrast, mills which run steadily on one or two grades will find the machine coater better suited to their needs. They can adjust their machine coaters for long runs, concentrate on curbing variations in coating and in raw stock, and reap the benefits of large tonnage with few people. Since their coating formulas and furnishes seldom change, they can by intensive operation research obtain the ultimate efficiencies from their materials and equipment. Any developing trend would seem to relate to the type of coating involved. One type of coater may be growing at the expense of another. Since we know of no transfer roll coaters being installed, we have turned our attention to the blade and the air knife.

High Tonnage Areas

Initially the blade coater was tried on bread-wrap and was highly successful. It then progressed into the coated publication field and about the same time into the coated solid board field where it found ready acceptance. More recently the blade has been used as a top coater on coated book and high quality publications. All of these were high tonnage areas where a coater could be built onto the paper machine for the purpose of coating a few standard grades with a minimum of changes. Although there were highly successful dissenters from the trend, the on-machine coater was ideal in this situation. With one notable exception the trend has been toward more and more on-machine coaters.

The exception was in the area of blade coating as a prime coat or light weight coat in competition with size press coating. The size press coater itself is an on-machine coater. There is little doubt that the blade applies a better pattern-free coating than the size press. Yet it requires two coating heads and more operator attention to coat both sides of the paper thus increasing its cost. Mills interested in prime coating will be hesitant about installing a blade coater until its relation to size press coating becomes clearer. The off-machine blade is preferred in working out the answer.

The air knife should be mentioned because of shifts which have taken place in its growth. It started as a conversion coater and experienced a tremendous on-machine growth in the coating of solid bleached kraft board. While certain specialty coatings could best be applied with an air knife, the relatively low solids was a draw back and a thin trailing blade coating was found to give a superior printing surface. In addition the light weight blade coating offered an advantage of higher caliper per pound compared to the heavier air knife coating. Since many machines were already equipped with air knives, the addition of a trailing blade led to many combination on-machine coaters and raised the print quality of coated board. At the same time the intense interest in the trailing blade modified the growth of the air knife.

More Flexibility

It is suggested that both the trailing blade and the air knife have reached a plateau because the large tonnage on-machine coating applications have now been filled. Aside from normal growth in these areas, which is not to be minimized, the new installations will require units having more flexibility than in the past.

New coaters will have to be adaptable to a variety of formulations and subject to modification as customer requirements change. If the trailing blade is to continue its expansion, it will have to prove itself superior to the air knife as an adaptable coating tool for mills who are trying to uncover new uses for coatings.

It is our feeling that the coating formulation may be varied over a wider range with an off-machine coater. Often there is limited drying on the machine coater due to limited space or due to speeds desired from the machine. The coating formulation must be adjusted to suit the drying equipment. While the same may be true off the machine, there is usually greater drying capacity and greater readiness to reduce speeds if

necessary. This gives the coating formulator a wider range in solids, coat weights and, in particular, binders since the adhesive is usually the component most difficult to dry. For example casein can be used in place of latex if drying is adequate.

Off-Machine for Specialties

To summarize it is believed that with the exception of size press coating there is a trend to off-machine installations especially in mills who cater to specialized needs. This trend has recently become evident because on-machine coating requirements in standard grades have been satisfied. The trend is being reinforced because greater knowledge about the use of the blade and the air knife is uncovering new specialized coating areas where machine coaters are not appropriate.

On-Machine Coater Best For "Bread and Butter" Grades.

A. W. Neubauer,
Crown Zellerbach Corp.

"Use the tool that fits the job!" Though there has been a feeling that the trend in coating is toward off-machine operation, isn't it quite probable that some recent installations have been made to attain flexibility? Usually we feel, the "bread and butter" grades fit best on-machine and the specialties, off-machine. The decision of on- or off- must be based on the relative efficiencies of the machine and coater, the available area, handling, flexibility and just plain dollars. Because of extra manpower required, conversion coating could cost more but it too has "plus" factors in not being tied to one machine. There are instances where the marriage of a machine and a coater have been an unholy combination and others have been a fairly trouble-free, fruitful pair.

Certainly, blade coaters as a family are receiving the most attention today. They present some definite problems and we will see further modifications.

The drying of a coated sheet is beginning to receive aggressive attention. As speeds increase and formulations are modified, this phase will require more active study. We have already gone past the point where we just dry the coated sheet.

Coating color formulations have undergone and will continue to undergo changes. The natural binders are being modified, the synthetics are finding their place and the pigments are being adjusted to meet more specialized requirements. More custom-tailoring can be expected in all the facets of coating color mixes.

Each of us aspires to one common goal—to have a satisfied customer. What could be a better reason for a trend toward "custom-lines"?

Definite Trend Toward Off-Machine

G. L. Booth,
Executive Sales Engineer, Black-Clawson Co., Inc.

There are many ways of establishing categories for coating systems such as on-machine coaters and off-machine coaters, by the type of coater itself (blade coaters, air doctor coaters, roll coaters, metering bar coaters, cast coaters), or as paper coating vs. board coating.

Today, the main concern seems to be the application of blade coaters for both publication and fine papers work. The real issue is whether to put a high speed blade coater on the paper machine or whether to put it off the machine. The trend definitely is to off-machine installations primarily because of the very high rate of speed at which blade coaters can operate, the lengthy downtime required for clean-up when the web breaks or trouble of some nature develops, and the problem in web leads that inherently come with a tandem coating operation as opposed to a simultaneous two side coating application. If we at Black-Clawson were to establish general ground rules as to application of coaters, it would be as follows:

Paper

A. Blade coaters—Off machine
B. Roll coaters—On machine
C. Air doctor coaters—On machine
D. Metering bar coaters—On machine
E. Cast coaters—Off machine

Board

A. Blade coaters—On machine
B. Roll coaters—On machine
C. Air doctor coaters—On machine
D. Metering bar coaters—On machine
E. Cast coaters—On machine

Certainly the above listing would be only a general rule of thumb and subject to much more thought as to the application of the particular unit, the grades being made, machine efficiency that can be expected, coat weight involved, speed of operation, and the presence of a pre-coater or a post-coater, that is whether it is to be a two side double coating application, either wet on wet or conventional.

Considerations for On Machine

In the installation of a coater, specifically a blade-coater—on machine, the following areas must be thoroughly considered:

1. Experience in the coating field, and specifically the particular type of coater to be used.
2. Availability of trained personnel.
3. Machine adaptability to the coater installation such as paper machine speed, type of coater or coaters, space available, drying requirements, type of machine drive and desired coating speed.
4. Adaptability of the coater on machines with considerations as to grades to be coated, per cent of machine production to be coated, number of grade changes, and number of customers to be served.

Considerations for Off Machine

A. Number of machines producing rawstock for coated grades.

B. Available space for off machine installation.

C. Flexibility of operation that is required.

D. Roll storage and handling.

E. Capital investment (normally higher for off-machine).

F. Economic consideration such as cost, personnel, amortization rate, and paper machine efficiency.

No Easy Answer

In closing, it can be seen that there is no really straight answer when considering blade coating as to whether it should go on or off machine. As stated earlier, the trend definitely is to the off machine high speed blade coater installations for paper. Even in the case of double coating with a roll coater preceding the blade coater, it is felt that there are very strong arguments for the case of a blade coater off machine especially if more than one paper machine is producing a coating rawstock grade of paper. In the case of air doctor coating, the off machine unit is the only answer primarily because of the large amount of water that has to be evaporated from the coating and the mechanism of evaporation of water from an air doctor coated sheet.

In the case of board, normally only on machine coater should be considered regardless of the type because web leads, machine speeds, and drying considerations do not impose such severe limitations as in the production of paper.

Past Practice Followed in Coater Selection

W. B. Cook,
Minnesota & Ontario Paper Co.

Increases in coated paper productive capacity have been very great in recent years. Both the old established coated paper producers and companies new to the field have been attracted by the expanding markets for coated grades. Introduction of the blade coaters has caused a tremendous upheaval in quality standards. As each company attempted to choose the best equipment combination for its particular needs a variety of installations have resulted for reasons that may not be clear to an outside observer.

I have noted in the publication text field that seven major companies have announced projects expected to increase capacity by more than 420,000 tons per year which are coming into production in 1961 or will be coming into production in 1962 and 1963. Only one plans to install off-machine coaters. The announced projects indicate that those most experienced in the field are following their past convictions. They are adding on-machine coating facilities if they have coated on the machine traditionally and adding off-machine coaters if this has been their customary method of production. New producers in the field are installing on-machine coaters.

Follow Past Practice

At present it appears that where new construction is involved with

adequate space available, on-machine coating is still the preferred method for publication text. Where old machines are being converted or rebuilt, space requirements may cause large incidental capital outlays to move other mill departments and provide longer machine rooms to accommodate on-machine coaters. In these cases there may be a real economy in the installation of an off-machine unit.

Three paper producers have been in the news lately because of new coating equipment for producing enamel grades. In one case two blade coaters were installed on the machine to follow an existing roll coater. In another case the existing roll coater became a pre-coater and the new coating equipment was installed off-machine. The third company installed off-machine coating equipment. Again, each company followed its past practice with regard to on-machine vs. off-machine methods.

Apparently each case must be studied as a new situation and no rules can be applied in favor of on-machine or off-machine coating. Even with the best operation the paper machine efficiency can be expected to be 1.5 per cent to 2 per cent lower for each coater on the machine. Since most new coating installations involve two or three coating stations, the total loss in efficiency may run 4.5 per cent to 6 per cent. Balanced against this loss are several items of cost with regard to off-machine operation which must be considered. Typically, a separate coating unit will require two or three more men per shift. Movement of base stock reels from machine to coater takes time, manpower and money. Rarely can the broke created at a separate coater be handled as efficiently as can the broke from an on-machine installation. The opportunity to test, check and reject base stock before coating and to make machine changes to improve base stock deficiencies may be an important factor in the minds of some who favor the off-machine method. It can be argued that this will reduce coating losses and raise coater operating efficiency.

Difference in Quality?

From the point of view of quality there seems to be little choice between on-machine and off-machine coating. For high quality enamels involving small orders, off-machine coating is still a necessity. For large volume producers, competitive papers in the field made on-machine and off-machine seem to be a stand-off. Depending on the source of the comment, one observer will rate the off-machine sheet higher and another observer will rate the on-machine paper higher. The skill of the paper company is more important than its choice of method.

By and large I see no particular trend toward off-machine coating as a preferred production method but rather a tendency to use available space in the most efficient manner when new coated paper equipment is installed. For new installations the straight line production with on-machine coaters seems natural. For conversions and rebuilds the advantages of lower amortization costs from existing buildings and paper machines can offer reduced production costs to balance any necessary loss of convenience and extra expense in the operation of off-machine coaters.

Finishing Comes of Age

The "orphan" of the industry is growing up! A variety of modern equipment is available that finally makes possible automation of the finishing line. An expert in this field tells how to take advantage of new machinery.

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Portland, Me.

Not so long ago finishing was labeled the "Orphan" of the paper industry. Great strides had been made in manufacturing paper at higher speeds to better quality standards. New pulping methods and equipment had been developed and paper making machinery had been improved right down the line . . . only to come to a dead stop at the finishing room. By comparison with the rest of our industry, the finishing operation had not progressed beyond the Dark Ages.

Today the picture is changing. An impressive array of modern equipment for all phases of finishing is now available to bring this operation up to date and eliminate bottlenecks. This article is concerned with these new developments and the improved finishing operation they make possible.

In an earlier article* I pointed out, among other things, that each finishing operation is greatly dependent upon the operation which precedes it as well as the one that follows. So, to present this discussion in orderly fashion, I will try to follow a first thing first concept.

Electronic Scanning

Besides being an element of quality control the electronic scanner is a most important communicative source. Depending upon how and where it is used, it has the ability to transpose its results into a tangible interpretation so that "news flashes" are currently broadcast for all concerned to read and understand, and know currently what is happening.

Electronic scanning which has been in development for several years is unquestionably at the stage of arrival and cannot be looked at with the same skepticism which has been largely the case heretofore. It has been developed to a high degree of technology with the intention of being a marketable commodity, as is your paper.

Electronic scanning is therefore no plaything; neither is it a scientific projection. It has already been achieved. Challenge it if you will, but when you do, look at all its many aspects. Don't think only of what it will not do; think of what it will do. There is a good chance that the things it will not do are not as necessary as was at first thought.

Electronic scanning units have been designed with the realization that the paper mills have a variety of market conditions and a variety of grades to contend with. Speeds of the equipment vary as does the time element. In addition some paper is shipped in roll form and some in sheet form. Yet electronic scanning units have been designed to help you find the most practical place in your operations to attain a beneficial result regardless of your present process. Even the price of some of these units is designed according to your needs.

Fitting the Scanner in Your Process

Today electronic scanning units may be placed on paper machines, calender stacks, off-machine coaters, re-winders, rotary cutters or special sorting machines. Width is no problem; speeds up to 6,000 f.p.m. are no problem; neither is it a problem whether the paper is in web form, or sheet form, and it makes no difference how many times you slit. Some of these electronic scanning systems offer you the opportunity to grow but not outgrow. Where you put a scanning system in your production line will determine how best you may prepare to automate and expedite your operations.

It is possible to detect flaws as small as 1/64th inch equivalent diameter area. It is possible to detect flaws affecting surface elevation as low as .0001 inch. It is also possible to automatically aggregate defects smaller than 1/64 inch in a specified area, and if the total individual defect areas equal 1/64 inch, an automatic re-action takes place. If you say to me that you don't want to take out defects so minute, I say to you, don't do it. It is your choice, the machine is virtually your servant.

In those instances where electronic scanning is used on web to web operations, then defects may be detected and the web (or webs, when slit) automatically edge marked. The frequency of these defects at the production machine may be computed by digital recorders (at a remote location if necessary). Two major classes of defects may be digitally set up and recorded. These are defects; (1) such as lumps, holes, cuts and the like which affect surface elevation; and (2) those such as dirt which are internal, not affecting the surface elevation.

The installation of an electronic scanner on web to web operations is suited to those mills where the paper is going to remain in web form as well as those mills where the paper is to be converted into sheets. In all instances quality condition is established, and information is relayed pertaining thereto—Rolls are certified! The frequency of defects, and operating units contributing thereto, is also pinpointed.

In many mills where grades are multiple and orders short run, the situation occurs especially on "making orders," where an order shows up as running short because of a subquality condition, and a re-run has to be ordered. It appears very logical that advance quality information such as discussed here can go a long

*Paper Trade Journal, March 28, 1960.

way towards meeting this situation before an order change has taken place, and so reduce the make-up and re-scheduling problem.

Summarizing all the foregoing then, we have established that electronic scanning is flexible as to mill production equipment. It will provide us with realistic chosen quality control information. It will provide advance information for us. It will assist us in determining how we may establish ensuing operations in order to realize better flow, more automation and economic advantages.

Before leaving this subject and passing along to ensuing finishing operations, I would like to add a short elaboration on economic advantages. This means not only reduced operating cost of current operations but to my way of thinking it also means a potential upgrading of finished paper. It also means a forward step in quality control of rolls for certain markets. I submit that, while some markets find your paper acceptable at present, will markets continue to find the paper from the same source equally acceptable when another supplier offers better quality controlled paper at the same price? Who can deny that up-grading is one of the foremost factors of competition?

Rotary Cutters

Rotary cutters are in the process of improvement and re-development. In the past they have been looked upon as a necessary means of converting rolls to sheets and nothing more. Short comings of cutters could always be taken care of by installing more of them, or by correcting for the shortcomings in ensuing operations.

I believe that when we talk about cutters we must recognize that there are three essential components comprising a cutter: first the backstand, second the cutting unit, third the delivery system. It is not my intention to discuss cutters in great detail as to engineering components. It is my intention to discuss cutters and their place in coming events and in relation to what can take place before and after cutting. Since we have already blueprinted in the section on electronic scanning what the possibilities are before cutting, now we will deal with the actual cutting operation.

There is a considerable drive on to greatly increase speed and accuracy of cutters, and to make them more flexible by adding various designs of delivery systems. Speeds of present day cutting units are somewhat impeded by the delivery systems. This is more the case with single roll sheeting than with multi-roll sheeting. We are all aware of this. If we aim for high speed and close tolerance to reduce guillotine trimming, we want to be able to lay the paper into the delivery piler in a condition suitable for a printing press feed. When we can do this, we can also direct the cut sheets to other automatic or semi-automatic finishing units. As we increase the speed of cutting we must obtain backstands to enable us to load quickly and to provide an adequate means of controlling web tension and paper feed to the nip.

One improvement forces another and, as of the present time, the development of advanced rotary cutters is well underway.

The Author

There will always be cutter styling to meet pocket-books and mill conditions—there has to be. How you are now handling your paper in finishing will dictate what selection of equipment you make to improve this handling. One well known paper mill executive said not too long ago in a well-written article on finishing that it was pathetic how we processed paper so fast and so automatically until it reached finishing. Then we took the nice running stream and started to dam it up and let it through in eye dropper form. Today we are at that point where many of the problems which imposed the eye dropper upon us have been supplanted by several means of dispersing or reducing these problems. Soon we will be able to attain more direct and less costly methods.

Improved Equipment Available

Today we have fast loading backstands with tension control.

We have cutters capable of operating at speeds in excess of 1,000 f.p.m.

We have delivery systems capable of handling high speed production in the 1,000 f.p.m. plus range under certain conditions, but these have not yet proven to be as versatile as the cutting component.

We have cutters with greatly improved drives and controls which are claimed to have a cutting accuracy of 1/64 inch or less under certain conditions.

Other improvements to the cutter include a double piler which contains a reject piler ahead of the primary piler. There is also a double piler which alternates the piling of cut sheets and automatically ejects a sequence of cut piles to packaging machines.

In addition a continuous piler is available which is a component added to the primary piler to afford continuous running of the cutter while full skids are being push button ejected and new ones put in; or it will allow dispersal of lesser quantities of paper while still in full operation. This has now been improved to handle various basis weights of paper.

We also now have a stack-sorter which when equipped with a simple sensing device, or the more sensitive electronic flaw detection device, will accept stacks of sheets, feed them one by one, inspect, reject defective sheets and re-pile good sheets. This is an automatic unit which operates at relatively high speeds and does not require human attention as somewhat similar and less refined machines did in the past.

All this is a tremendous potential. Let's now look realistically at the possibilities due to these technological advances.

What Can Be Done With Modern Equipment

1. Electronic Flaw Detection—before cutting.

When this system is developed, the condition of the rolls will be tagged as a result of electronic web scanning and web marking during the last operation prior to cutting. This should indicate which rolls are customer defective and which are not. As a result of this information, we would separate for cutting purposes the good rolls from those containing rejects.

Good rolls may be single roll sheeted at high speed with precision, and transported directly from the piler to the selected packaging operation by mechanical means.

Defect rolls may be handled by one of two methods:

a. Group cut and piled in con-

ventional manner. Skid loads removed and placed in a stack sorter and sheets automatically fed through this machine. The sheets will not be flaw scanned but instead will be mark sensed to permit the automatic rejection of bad sheets and the repiling of the good ones. The good sheets would then be directed to the selected packaging operation, or to an intermediate trimming operation depending upon precision of the initial sheeter.

b. Single roll cut with precision at high speed on a cutter equipped with double piler (good and reject) and mark sensing device. The good sheets will be piled and directed to the next packaging operation.

2. Electronic Flaw Detection—before cutting (alternate method).

Group cut all rolls into conventional piler. Then feed skids of sheets into stack sorter and by using the mark sensing device mechanically sort all paper, directing the good paper to the packaging operation or intermediate trimmer, depending upon precision of initial sheeting.

3. Electronic Flaw Detection — at the cutters.

In this system quality is determined at the cutters which means electronic scanning equipment together with double pilers must be installed. This system fundamentally would have two methods of approach.

A. Group cut the rolls which means that there must be several electronic scanning heads at a cutter in order to scan the respective webs going into the nip. Direct the good sheets to the packaging operation or to the intermediate trimmer depending upon the initial sheeting precision.

B. Single roll cut at high speed with high precision. All defective sheets are detected and rejected and all good sheets directed to the packaging operation.

Throughout the foregoing, group cutting rolls as well as single roll cutting has been discussed on the basis that alternate ways must be provided to meet varying requirements. In those mills where group roll cutting is normally done on relatively heavy backstand loading compared to other mills, cutter output could become a problem when converting to single roll cutting. The rest of the operation might be of such limited proportions, that when reoriented for greater automation, the amount of pay-back as well as other considerations may make the conversion unattractive. Also to be considered is the investment in new machine tools and utilization of these in a new plan.

The rotary cutter when supported by electronic flaw detection and the stack sorter becomes a more important basic pivotal point of finishing operations than it ever has before simply because it becomes a multipurpose unit and not just a means of sheeting paper.

With either the sensing or flaw detection devices installed on a rotary cutter, a reject gate causes to be rejected all sheets across the web companion to the one detected as defective. This gate can be constructed sectionally and controlled sectionally by quick adjustable impulse contacts so that only the actual defect sheet is deflected into the reject piler.

When group cutting (and group scanning or sensing), the reject piler has a relatively high content of good paper. The automatic stack sorter provides the means for resorting this rejected paper and since this unit handles each sheet separately will provide a higher yield.

In those instances where it is necessary or desirable to recover good paper from the defective sheets themselves, then the practice of cutting these sheets in half and putting this paper through a stack sorter is quite feasible. I know that this is a practice with certain grades of paper in many mills today except that the re-sort is done manually.

Roll Paper

We have discussed the relationship of new equipment and methods for sheet operations, now let us take a look at the situation relative to roll paper.

The same versatility of electronic scanning applies here to the extent that the quality condition of rolls may be determined at the dry end of the paper machine or in the final coating or calendering stage. Therefore, before the customer receives the paper, his quality requirements are assured. Now the question comes up—what are we going to do with the defective rolls which we have produced?

It would appear that there are several avenues of approach open. One of these approaches would be to convert to sheets those rolls which have a frequency of defects which would inflict more than the permissible number of splices. I know there are many instances when this is the practice. In such a case one of the previously explained sheet systems is available.

Another approach would be to rewind, utilizing an edge mark sensing device which would detect and signal the oncoming defect. The defective section would be taken out, a splice made and re-winding continued.

Assuming that the diameter of shipping rolls would be less than that of the making rolls, then a third approach would be to re-wind to required shipping diameters. Until the edge sensing device registered an alarm and activated the stopping mechanism, it would be assured that the re-wound rolls are up to required quality.

With modern equipment it is now possible to direct the paper from rotary cutters in a line to the next operation whether it be guillotine trimming or packaging. We no longer have manual sorting to contend with, nor do we necessarily have to contend with the same degree of trimming.

The system can become more of an in-line movement by establishing quality in advance and by minimizing guillotine trimming. These have been two factors which heretofore have restricted mechanization of the finishing line by inflicting more variables than any other operations I know of.

New and Improved Equipment

We now have automatic ream splitting equipment which will take quantities of paper fed to it from a continuous delivery system and measure out these sheets into packs of 500-250-125 or what have you. The packs are then ready for in-line feeding to automatic wrapping machines which are now available to take care of parent size packages as well as the 8½ x 11 inch range.

We still have devices for unstacking full skids (if this is the chosen delivery method) so that this paper may go to the trimming operation, to the wrapping machine or into cartons.

We have skid banding equipment where full skids may travel direct from the rotary cutter or stack sorter to the banding station. This is now a well mechanized unit and is comprised of in-feed conveyors, skid press, banding, weighing and conveying out of the station.

We have the system previously mentioned where on small size papers such as 8½ x 11 inches a special style rotary cutter is used which cuts with precision, piles the sheets in reams, and automatically discharges reams directly to the automatic wrapping machine where the packages are completed and ready for cartons.

We have stacking devices for pa-

per coming from the guillotine trimmers as we have had in the past. We have automatic telescopic carton sealers, case type sealers, palletizers (semi and fully automatic) and automatic bundling.

We have completely automatic guillotine trimmers of greater precision than ever. Even the settings are no longer left to the human element.

We have well proportioned and flexible roll wrapping equipment which offers many ranges of price, automation, and flexibility depending upon requirements. Roll sizes, header sizes, wrapper sizes, etc. have all been provided for in this roll system.

Certainly then we have today a marvelous array of well thought out units of equipment all lending themselves to continuity from paper making through the finishing operations.

Planning and Economics

Frankly I believe it to be a rather uncomplicated procedure when in the initial stage of planning you start out by drawing flow charts which incorporate modern equipment in several potential forms. Draw similar flow charts of your present operations and systems. Operating costs and estimated new operating costs may be entered on the flow charts where they are incurred, and a comparison made. A very revealing comparison in flow and resultant "straightening out" is obtained when the initial flow charts are drawn on transparent graph paper and one superimposed over the other. Space in between operations shuld be identified. The comparison will reveal potential reduction in carry and set down—pick up and carry, and so indicate space reduction and in-process handling.

It appears to me that we are closer to a standardization of methods than we have ever been before. It appears that all mills, the large and the small, have an opportunity for relative improvement of their operations and it is important and necessary that there is a way for all.

I believe that if an approach to industry standardization could be made as to what is acceptable printing paper and what is not, a still further advantage would most certainly accrue. It would certainly be healthy progress and I cannot help but wonder why there cannot be a more tangible approach made, and not on an isolated basis between trade and customer. In this respect I am not talking about tear, opacity, fold, printability, etc., I am referring to the *defect* situation.

Material handling methods are going to be simplified and as the finishing operation "comes of age" we will see less of the human element and less intermittent movement of goods from place to place. In turn better and faster communication will lead to simpler and more automatic in-line operating methods.

It is my opinion that the flexibility of the components discussed affords the opportunity for paper mills as well as converters and printers to take advantage of certain equipment to facilitate their own operations. It is conceivable that some of it may best be fitted into the consuming operation as opposed to the paper making source. In certain instances I believe this could be of mutual advantage.

Charts Show New Systems

Three flow charts are presented on these pages to show how electronic scanning may be applied in the finishing department. Charts A and B compare present methods with new methods. Chart C establishes a new method only.

These charts are intended to establish outlines from which alternate systems may be tested on paper for flow and economic comparison. They employ electronic scanning and rotary sheeting as the focal point. There is much automation to be added in the near future to more specifically show semi-automation as auxiliary to the focal point.

It is a simple matter to take all the elements included on the charts and reshuffle, add, delete, or change the balance as machine output, and scheduling and quality conditions warrant. Costs and out-put and time should be inserted together with manpower to reveal the required buildup to maximum output requirements.

Electronic Scanning

Chart A deals with off-machine coated paper. However parts of it such as recovery for example may be included for operations other than off-machine coated.

The new method shown is more practical when rotary cutter is treated as a single roll item. If this was not done, then there is a problem of increased investment for multi-scanning heads and naturally there will be more of a mixture of rejected paper.

However, in the event that multi-roll sheeting was decided upon, or in the event that by multi-slitting, there is also derived an excess of good paper in with the bad, then the recovery procedure is represented by a reverse cycle flow as indicated by dotted line. This means that the "cut in half" operation would come after the mechanical resort and scan, so that you were only cutting down the size of your rejects. Sheet size of order or requirement would influence this.

Chart B deals primarily with machine coated paper. A recovery procedure as in Chart A may be inserted with same comments. Here also we primarily deal with a single roll cutting procedure, and trimming as a primary function is eliminated.

This procedure is very simple and clean, however cutting production requirements to meet total mill out-put may be a problem. Much depends upon the daily rolls to be cut and

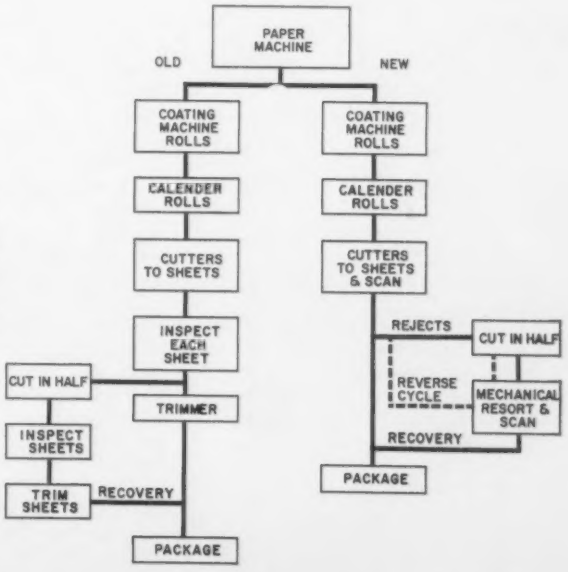

CHART A — Application of electronic scanning when it is applied in finishing area as a function of that department.

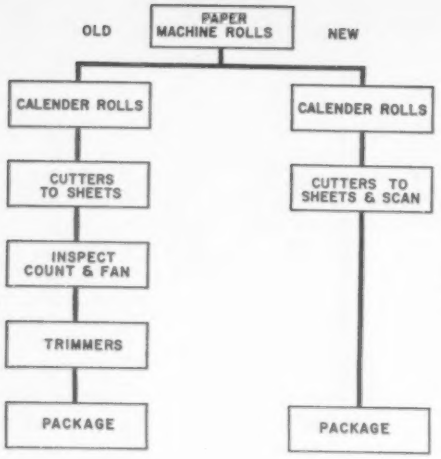

CHART B—Application of electronic scanning when it is in finishing department and conditions afford a simple straight through sequence of operations and all scanning can be accomplished on a high speed precision single roll cutter.

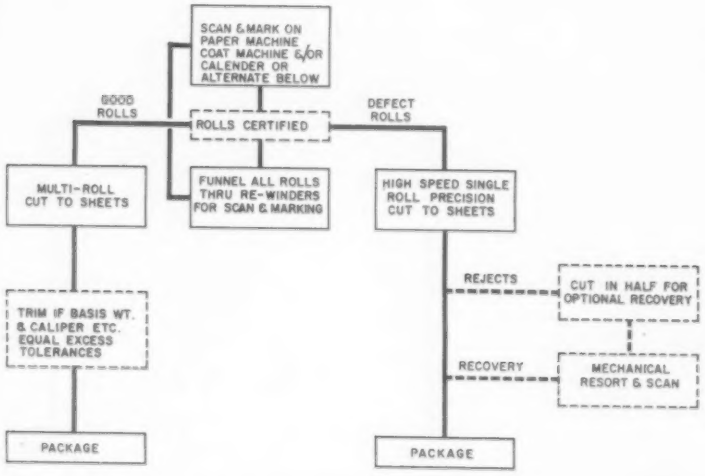
SCAN & MARK ON PAPER MACHINE COAT MACHINE &/OR CALENDER OR ALTERNATE BELOW
GOOD ROLLS
ROLLS CERTIFIED
DEFECT ROLLS
MULTI-ROLL CUT TO SHEETS
FUNNEL ALL ROLLS THRU RE-WINDERS FOR SCAN & MARKING
HIGH SPEED SINGLE ROLL PRECISION CUT TO SHEETS
REJECTS
CUT IN HALF FOR OPTIONAL RECOVERY
TRIM IF BASIS WT. & CALIPER ETC. EQUAL EXCESS TOLERANCES
RECOVERY
MECHANICAL RESORT & SCAN
PACKAGE
PACKAGE

CHART C—Application of electronic scanning when applied in the prefinishing of paper, primarily, and in the finishing department as a secondary function.

average backstand loading. This varies widely among mills. However there is flexibility which allows this flow system to be enlarged upon as conditions may dictate when measured.

Chart C is all new and follows an often preached doctrine. Scanning with defect marking and digital and/or alarm recording may be done on the paper machine or calender stack or both if pin-point efficiency is wished.

The roll out-put is certified and tagged to be either good or defective. The digital frequency may also assist in determining whether certain rolls may be further processed at all. Very important in roll mills.

You may change the flow balance here by reversing the order of the good or reject rolls. Any change should be determined on the basis of long term experience in order to set up standard production lines.

This system makes more use of multi-roll sheeting and single roll sheeting as a necessary conjunctive plan.

The sensing apparatus on the cutter is minor in cost, the work has all been pre-scanned. Here again a recovery system may be inserted on the one side and on the other a trimmer may be inserted depending upon cutter and tolerances.

The reason for resort scanning instead of just mark sensing is because of the inability to tell whether defects may run full across the center of the parent size sheet. However if a degree of test sampling is done at the cutter reject piler, it is very simple to determine whether the defects are localized, and by identifying the side to be trimmed off, much resorting production becomes unnecessary.

The plan on this chart will adapt itself for all papers and conditions. It imposes responsibility at its source. It clearly establishes a cost measurement of the quality variation as it is, and as it will change from time to time and by grade.

Development of New Concepts

A feature of the charts that follow is the subject of machine hours, especially rotary cutters which in turn affect investment. I personally do not hold with the thinking that scanning belongs necessarily on rotary cutters, nor with the thinking that a high speed single cutter of the "so called" straight through type is necessarily the objective either towards lower costs or productivity. There will be many instances where the high speed single roll cutter offers the best solution but as to this "straight through" theory let me say that the paper traveling straight through, standing-up, side-wise, or any other way, is irrelevant to the problem of cutting to tolerances of reasonable precision. This may invoke some eyebrow-raising, however let it be known that rolls *are* being multi-cut to tolerances of less than the heralded 1/64 inch and not on a straight through rotary cutter.

I believe that modifications of paper flow through the rotary cutter are justified. I believe that it also should be a multi-purpose machine. I believe further that the paper caliper changes of various grades and weights expected to be put through a specific cutter are the variance factors with sheet lengths which will most affect the design of a cutter for your use. I hold no briefs except to attempt to present possibilities and request that you keep an open minded approach. Scanning is now flexible enough to meet all situations.

In attempting to present some systems factors for consideration, I have ignored such things as trim, long grain versus short grain, etc., or the probability that when you cut a defect sheet in half some defects will cross the center and so you won't recover 50 percent of the re-sort.

Basic Plan Summary

Summaries of five basic plans as included in Charts A, B and C are shown below. This reference key describes briefly the procedure which takes place in electronically scanning the paper, cutting it and refining it ready for the final stages of packaging. The five basic plans submit that machine loading is an important element in conjunction with elec-

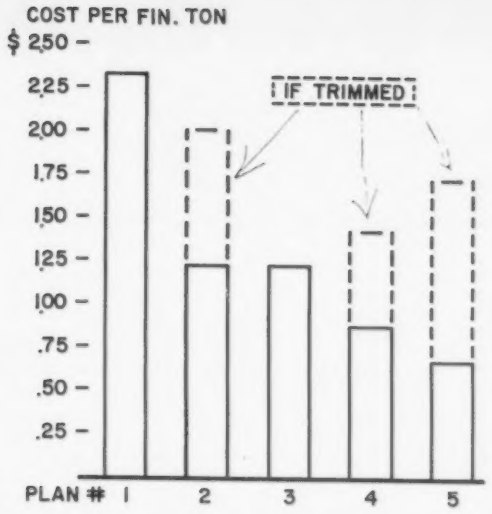

CHART D—Five Basic Plans comparison costs per ton. These are labor costs only, and are specific to the basic plans outlined. The costs will vary as weight and size of the sheets and other conditions change.

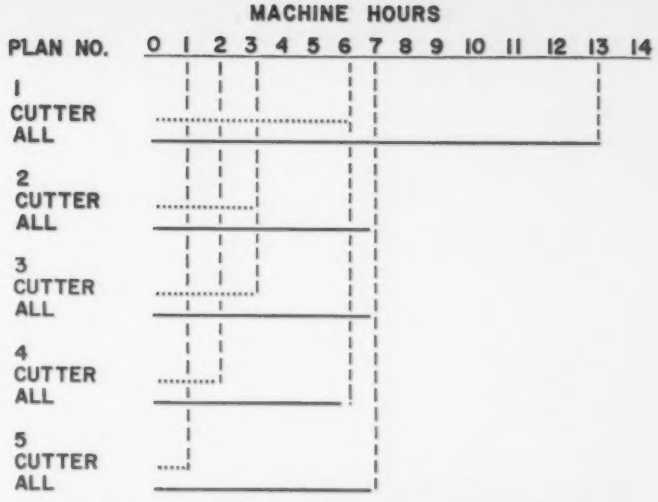

CHART E—Five Basic Plans comparison of machine hours. Included in the heading "All" are: scanning either prior to finishing or in finishing; mechanical resort; and trimming. Total machine hours for plans 2 and 3 are equal because of a shift of production between types of machines entailing different labor costs.

tronic scanning and that there is flexibility to meet mill conditions in many ways.

PLAN ONE

Single roll precision rotary cut and scan on cutter. 50-in. wide rolls
Mechanically re-sort rejects for recovery.

PLAN TWO

Paper pre-scanned and marked. 50-in. wide rolls
Multi-roll cut certified good rolls.
Single-roll cut certified poor rolls with cutter mark sense.
Mechanically re-sort rejects for recovery.

PLAN THREE

Single roll precision rotary cut and scan on the cutter. 100-in. wide rolls
Mechanically re-sort rejects for recovery.

PLAN FOUR

Paper pre-scanned and marked. 100-in. wide rolls
Multi-roll cut certified good rolls.
Single-roll cut certified poor rolls with cutter mark sense.
Mechanically re-sort rejects for recovery.

PLAN FIVE

Paper pre-scanned and marked. 100-in. wide rolls
Multi-roll cut certified good rolls.
Multi-roll cut certified poor rolls with cutter mark sense.
Mechanically re-sort rejects for recovery.

SAVINGS IN RECOVERY (BASIC EXAMPLE)

PROBLEM

1. Assume that defects are found in paper through the medium of electronic scanning to the extent that when it is converted to sheets at the rotary cutter, we are experiencing a total defective content equal to the following daily quantity—
   Total tonnage cut 100 Tons
   Total defect content 7% ..... 7 Ton
   Sheets are size 38x50
   Weight 50 lb. (25x38)
2. Assume that the re-pulp cost credit value is being accounted for at $60/Ton
   That the per ton mfg. cost up to point of rotary cutting was ... $165/Ton

RECOVERY

1. 7 tons 38 x 50 trimmed in half to 25 x 38 280 Reams
2. Mechanically re-sort 280 reams and obtain 140 reams good saleable paper and 140 reject.

ECONOMICS:

Trim 38 x 50—140 reams in half to 25x38		$ 7.28
Re-sort 280 reams at $.045 per ream		12.60
Trim 140 reams 25x38 good paper		3.64
Cost of 140 Reams Finished		23.52
Cost per Finished ton		6.72

Comparing Existing Method with New Method

Existing Method:

Original cost of 7 tons @ $165 ton		$1155.00
Original repulp daily 7 tons @ $60. ton		420.00
Lost Daily (Cost Dollars)		735.00

New Method:

Now we lose only 3.5 tons @ $105 ton	367.50	
ADD Recovery cost	23.52	391.02
SAVE Daily (Cost Dollars)		343.98

The savings figure may be justifiably increased when you consider the profit margin available since you do have a first grade saleable paper for disposal.

Some Aspects of Modern Drying Theory

A review of what is known to happen during the process of drying paper. This is particularly timely because of the many reported difficulties in the application of high velocity air-dryers.

R. R. Rounsley,
Mead Corporation,
Chillicothe, Ohio

A discussion of drying theory must inevitably begin with a presentation of a typical drying curve. Such a curve for air drying is shown in Figure 1. Although a drying curve like this has been accepted for more than 35 years, many aspects of it are still incompletely understood. The rate of drying is plotted against the free-moisture content, free moisture being defined as the moisture content above that which would be in equilibrium with the drying environment. The drying curve is invariably read backwards—from right to left. After a short initial adjustment period of unpredictable form, there follows a constant drying rate period in which the moisture, fed by capillary action, is evaporated at the exposed surface. A dynamic balance is maintained between the heat transferred to the surface and the heat used in evaporating the moisture. Once moisture can no longer be supplied to the surface as rapidly as it is evaporated, the rate of drying decreases. This starts the falling-rate period which is usually approximated by one or more straight-lines.

In the drying of paper few, if any, of the conditions necessary to the establishment of the air drying curve can be met. The use of can dryers and infrared heaters requires that new analyses be made of drying conditions. These all, however, may be more fully understood when the basic mechanism of moisture movement and removal is known.

It is an amazing paradox that the drying curve as already shown may be used to describe the conditions of drying on a hot surface. A period of questionably constant rate is followed by one or more falling rate periods. Since the conditions of the hot surface and of the air are mutually independent, there is no expectation of a balance between heat flow to the paper and the rate of evaporation over an extended range of moisture contents. Nevertheless such conditions are approximately existent. In the case of hot air drying Nissan, Kay and Bell (1) have extended into the falling rate period the equations for the balance between heat flow from the air and into the paper and the evaporative heat required by the vapor diffusing through this sheet. It is known that the evaporation front recedes from the surface once the falling rate period is started. If the bulk of the evaporation occurs at this moving front, it may be shown that within a number of restrictions the temperature at this front will remain constant at what is called a pseudo-wet-bulb temperature. This is the lowest temperature reached in the interior of the solid in the falling rate period.

Movement of Moisture

No mention has been made, so far, of the mechanisms by which the moisture moves through the paper. The knowledge of these mechanisms is fundamental to understanding the drying process. Serious errors result from a failure to acknowledge these principles.

An excellent analysis of hot surface drying has been made by Dreshfield and Han (2). They have extended earlier work on moisture gradients to show the amount and type of moisture migration. Moisture in the liquid phase will tend to move to the surface where it is being removed—this is generally the heated surface. By introducing dye in the liquid phase, an analysis of dye deposition and consequently the migration and evaporation may be made. By the use of beta-ray absorption, moisture gradients could also be found.

These are illustrated in Figure 2. The concentration of dye in the dry sheet is the result of evaporation of the water after it has carried the dye to the point of evaporation. A typical moisture gradient during the drying process is also shown in Figure 2. Notice that the greatest part of the moisture migrates to the hot

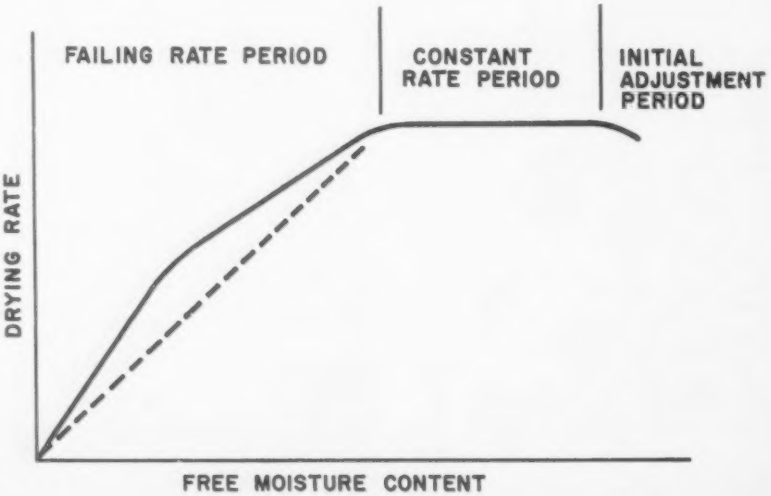

FIGURE 1

From a Seminar presented at the Mead Corp. Research Laboratory, Chillicothe, Ohio, for an Ohio TAPPI Meeting on October 17, 1961.

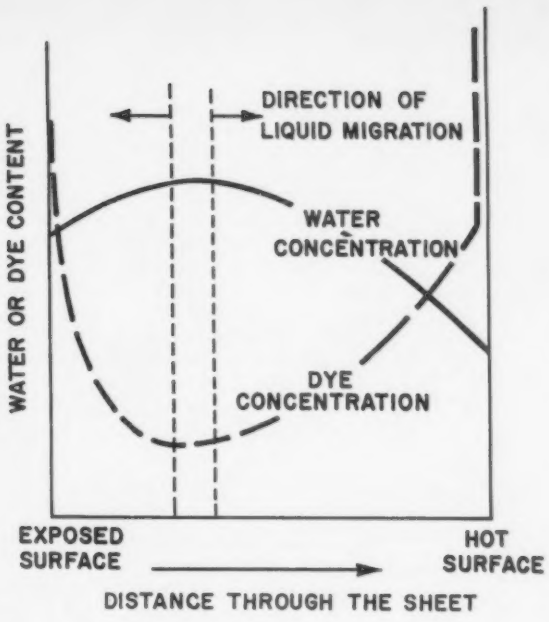

FIGURE 2

surface where it is removed by a change of phase. This same moisture must pass back through the sheet in order to leave the system. Careful analysis of the dye concentrations has shown that some recondensation of moisture must occur during this passage back. This further leaches the dye toward the hot surface. Notice also that a smaller amount of the moisture moves toward the exposed surface where it is evaporated. This leaves a starved area of dye close to the exposed surface.

This type of moisture movement can occur only so long as the liquid phase is continuous. On the paper machine the press section removes sufficient moisture to severely limit this type of migration. With coating, however, the small particle size and close packing make this an important aspect of both drying and of strength development.

The diffusion of water vapor through and from the paper would, at first glance, appear to be a simple straightforward phenomena. Indeed, under certain conditions it is. Under many more conditions it is far from simple. The simple cases have been treated most adequately in the literature.

This was the basis of Nissan's derivation. This was the basis of estimating moisture gradients in the falling rate period by many authors in the past. One aspect of this is most adequate for a thorough treatment. This is the relationship between the mass transfer coefficient and heat transfer coefficient to the flow of the surrounding air.

High Velocity Air Drying

The use of high velocity impinging air as an aid to drying has become commonplace in the last several years. A number of very good analyses have been made of these conditions (3, 4). A considerable resistance to heat flow to, and moisture flow away from, the sheet is contributed by the boundary layer at the sheet surface. Increasing the degree of turbulence decreases the boundary layer and consequently these resistances. A not-too-efficient way of increasing the turbulence is by increasing the velocity of the air impinging or passing the surface. This is at the expense of considerable energy to move the high velocity air. There is much controversy among the equipment fabricators as to where the point of diminishing returns occurs. Actual hood velocities run from 8,000 to 20,000 f.p.m. Allander (3) has pointed out that the supporting drum temperature was far more important than the air temperature in determining heat transfer. However, there are practical limitations to drum temperatures. This is one place where high velocity high temperature air hoods become more important. Much more drying can then be gained with existing space by resorting to this means. The effectiveness of high velocity air is questionable in the falling rate period where the resistance to vapor flow is controlled by the flow through the sheet.

Considerable work has been done on the configuration and design of the high velocity hoods. That is beyond the scope considered here.

Vapor Flow Through Sheet

Let us consider the actual flow of vapor through a sheet of paper. If diffusion of laminar flow controls, the flow rate is a linear function of pressure. This is the actual case, at least at lower rates of vapor transmission. The flow rate that we get with a unit pressure gradient is called the permeability. For air passing through paper at room temperature, the permeability will increase slightly as the humidity of the air is increased because of swelling of the sheet. This is indicated by curve A of Figure 3. We would expect a similar curve (but at somewhat

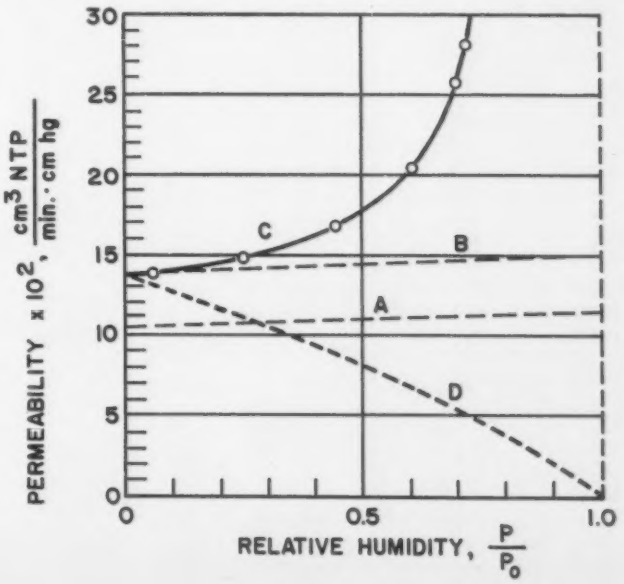

FIGURE 3

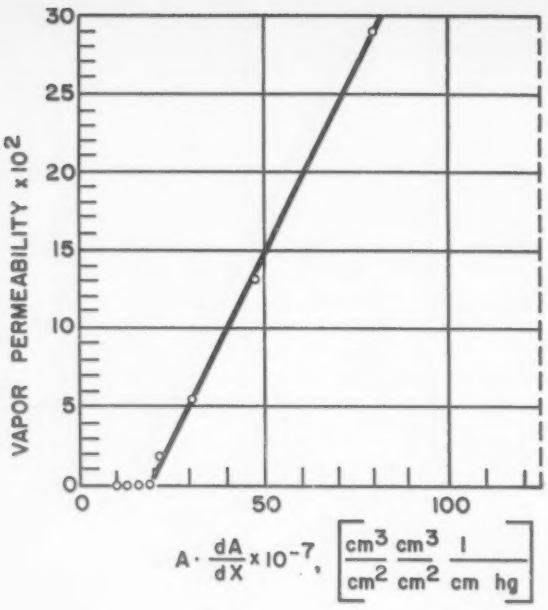

FIGURE 4

higher permeability because of the difference in molecular weights) for the flow of pure water vapor. This is indicated as curve **B**. The measured vapor flow will follow curve C as measured by Vollmer **(5)**. This tremendous increase in vapor permeability is the result of adsorbed flow.

The high mobility of a physically adsorbed vapor on a porous media makes this phase a very effective means of transmitting the vapor through the barrier. The entire process consists of: the adsorption of the vapor onto the solid phase, movement along the adsorbed layer toward the opposite surface, and desorption from the adsorbed layer. Vollmer **(5)** and Kammermeyer **(6)** have presented a semi-empirical correlation of the adsorbed flow permeability and the adsorptive properties of the sheet. The adsorbed flow was defined as the difference between curves **B** and **C** of Figure 3. The correlation of these data is shown in Figure 4. Here A represents the amount adsorbed and **dA/dX** the slope of the adsorption isotherm at this point. Notice that the permeability becomes negligible before the correlating factor **A·dA/dX** reaches zero. This can be explained by examining the adsorption process.

The first layer of adsorbed molecules are held to the cellulose by hydrogen bonds. That leaves this water in a relative immobile state compared to the successive layers of molecules which are held only by Van der Waals forces.

Considering the immense increase in permeability with the relative humidity it may seem strange that drying rates are so low. Janson **(7)** in fact has reported a good correlation between the heat transfer on a Yankee dryer and the air permeability.

A single vapor flow-pressure difference relationship extended to high vapor flow rates will illustrate the difficulty. At low vapor flows the pressure-flow relationship is linear as would be expected. At higher pressure differences, however, the flow does not increase so rapidly as before. This is a true flow curve and can be reproduced from either the high or low pressure end. As the pressure difference is increased still further a permanent deformation takes place in the paper and the flow increases more rapidly with pressure differences once more. Finally the sheet will break.

Drop in Permeability

The drop in permeability at higher flow rates may be accounted for in that the desorption process requires heat; it cannot be isothermal at a finite rate. The converse is true with the adsorption step. The temperature gradients set up by these energy requirements partially cancel the vapor pressure gradients causing the flow in the adsorbed layers. In some paper tested this began to occur at a flow of one lb./hr./sq. ft. which places this effect in the falling rate period.

Although it is theoretically possible to integrate all of these factors to describe the drying process completely, the time and data necessary are not available. This does not preclude using these theories as a guide. Brute force is not the answer to higher machine speeds; an understanding of what is happening so that proper concessions may be made is a necessity if quality papers are to be made at high speeds.

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Third Quarter Profits Present Welcome if Modest Change

Industry earnings begin to move upward but the effect of the few belated and modest price increases was slight as they occurred so late in the quarter.

John W. Saunders

Third-quarter earnings reports of the nation's producers of pulp, paper and paperboard presented a relatively pleasant change from the grim statements issued earlier this year. Profits of many companies continued to show signs of weakness but they frequently were better than in the preceding two quarters and more often than not were better than the third quarter of 1960.

PAPER TRADE JOURNAL'S survey of the latest earnings reports of 47 companies disclosed that profits of 29 companies for this year were below those of a year ago while 15 were ahead of their 1960 figures. Comparable results were not available for three concerns.

The industry split down the middle during the most recent quarter of 1961, with 24 showing increases and 23 reporting declines.

In terms of merely being ahead or behind 1960 results, these figures were virtually unchanged from mid-year results. On a relative basis, however, 32 companies were in a better position than they had been earlier this year. But 22 of these only showed less of a decline from a year ago than they had earlier. Ten registered an absolute improvement, with five of these changing earlier declines into increases.

Reports of 15 other companies indicated a weakening of their previous positions, with five showing a smaller rate of gain, six others showing greater declines than earlier, and three slipping into the minus column after formerly being ahead of last year's results.

Big Losers and Gainers

Companies showing the largest percentage declines on overall results this year were Albermarle, Minnesota and Ontario, Hammermill, Sorg, Rayonier and Chesapeake. The best gainers included Allied, Champion, Fitchburg, Sealright, Brown and Crystal Tissue.

In the latest quarter the sharpest declines hit Albermarle, Chesapeake, Minnesota and Ontario, Consolidated Water Power and Paper and Hammermill. Notable increases were scored by Oxford, Standard Packaging, Fibreboard, Champion, Sealright, West Virginia Pulp, Stone Container, Brown, Crystal Tissue, Fitchburg and Paterson Parchment.

In many cases, the increases were more apparent than real because results were being compared with the first two quarters of 1961—which represented the bottom and initial recovery stage from the recession—or with the third quarter of 1960—when the downward swing in the economy was well under way.

Karl R. Bendetsen
—Champion Paper

William R. Adams
—St. Regis Paper

Fourth-quarter results will seem even better by comparison, but, again, they will be matched with the highly unsatisfactory results of a year ago.

An interesting comment in this regard came from Karl R. Bendetsen, president of Champion Papers, which did very well in comparison with its 1960 results.

"Current earnings are far short of what are needed to assure the continuation, over the long term, of a successful and dynamic company," Mr. Bendetsen declared.

"While we are encouraged by the modest improvement shown, it is essential that we continue our efforts to reduce costs and improve productivity in order to enable us to attain competitive levels, below which we still remain."

Future Looks Brighter

The fourth quarter and early 1962 it appeared would be somewhat brighter, with the slow but steady recovery of the national economy promising bigger and better markets for paper producers. This, coupled with fairly small additions to productive capacity, could lead to firmer price structures, which would be a decided boon to industry profits.

Hopes for such a development were expressed late last month by William R. Adams, president of the St. Regis Paper Co., in a talk before the St. Louis Society of Financial Analysts. If the record volume of recent months continues, he observed, "1962 should be a much better year and a significant turning point for the industry and for St. Regis."

Operating statistics in the third quarter compared fairly well with those of the corresponding period

last year. Paper mills operated at about 85 per cent of capacity, compared with 87 per cent of the lower capacity a year earlier. Board mills worked at 88 per cent against 87 per cent in the 1960 period. For the first nine months of 1961, paper mills averaged 89 per cent, compared with 94 per cent a year earlier, while board mills averaged 91 per cent, compared with 90 per cent a year ago.

Third-quarter production brought total output for the first nine months of 1961 about 2 per cent ahead of 1960, in contrast to a decline of about one per cent at the end of the first half. Paper production of 11,600,000 tons was up one per cent; paperboard output of 12,300,000 tons up three per cent. Construction paper and board held steady at 2,400,000 tons.

Prices Were Key

Prices were the key statistic in the third-quarter operations. Increases toward the close of the period bolstered spirits more than actual results. Most companies will not begin to show the effects of increased prices for linerboard, various kraft grades and some converted products until results for the current quarter are posted. Meanwhile, continued high level of demand indicated that most of the price increases were here to stay.

Here's how these various factors were translated into dollars-and-cents by various members of the industry:

The industry's "Big Three"—International, Crown Zellerbach and St. Regis—chalked up fairly similar performances. St. Regis did better on a year-to-year comparison in the third quarter but its results in the first nine months were off more than the others.

International cleared $14,606,000 on sales of $259,802,000 in the September quarter. Sales were up four per cent but earnings were down four per cent. Volume of $770,555,000 in the first nine months were just a shade under the 1960 results but earnings dipped 11 per cent to $46,259,000.

"Prices for many grades of paper and paper products weakened during late 1960 and in 1961," the report declared. "Recently there have been definite signs of firming but in many segments of our companies' business current prices are substantially below the level of a year ago."

Crown Zellerbach's earnings of $9,944,000 in the September quarter also were off four per cent from

Reed O. Hunt
—Crown Zellerbach

Thomas B. McCabe
—Scott Paper Co.

1960 results. Sales of $143,433,000 were up very slightly. Profits for the first nine months eased eight per cent to $28,154,000 while sales held steady at $418,948,000.

Reed O. Hunt, president, noted that the quarterly results were the best of the year and pointed out that they had been affected by a work stoppage at the Bogalusa, La., mill. "Net income for the third quarter would have been ahead of the third quarter of 1960 if normal operations at Bogalusa had continued," Mr. Hunt said. He added: "Looking ahead into 1962, we believe that the present rising trend should continue into the first half of next year with a consequent improvement in our operational results during that period."

St. Regis had third-quarter earnings of $4,526,000, only 0.3 per cent off from the 1960 period, while sales climbed 3 per cent to $141,516,000. The third-quarter results were the best of the year but profits of $13,093,000 in the first nine months trailed year-ago results by 22.5 per cent because of sharp declines earlier in the year. Sales, however, were up four per cent to $414,798,000.

Commenting on the results, the company noted that price reductions during the year had continued to affect profits unfavorably. While prices have recovered in several divisions, the full benefit will not be felt until the beginning of 1962, it added.

Scott Paper continued to pace the entire industry, reporting record sales and earnings for the third quarter and nine months. Quarterly earnings of $6,796,000 were up six per cent from the 1960 period and nine-month profits advanced five per cent to $20,755,000. Sales showed parallel gains, amounting to $83,-840,000 and $246,877,000, respectively. The company capped off its performance by declaring a three-for-one stock split and raising the cash dividend to 60 cents a share from 55 cents.

Thomas B. McCabe, president, said the record profits had been achieved despite the costs of starting up a new paper machine at the Mobile, Ala., mill and a foam plastic plant. Output from these facilities contributed to the higher sales in the third quarter, he said.

Kimberly-Clark's report for the first half of its fiscal year indicated an improvement during the October quarter. Net income was up two per cent to $8,954,000 in contrast to a decline of 16 per cent in the July quarter. Half-year profits of $14,-802,000 were off six per cent from a year earlier. Sales were up five per cent to $252,689,000 after an October quarter gain of six per cent to a new high of $134,867,000.

Champion Papers improved on its very creditable June quarter performance, posting September quarter earnings of $3,423,000, which was 52 per cent ahead of the 1960 period. Profits in the first half of the company's fiscal year came to $7,103,000, up 40 per cent. The company noted that the 1960 results had been affected by special charges related to its investment in Vaculite, which has been terminated. It blamed lower prices for a three per cent decline in sales, which amounted to $78,456,000 in the quarter and $155,312,000 in the six months.

Increases in corrugated box and multiwall bag prices came a little late for many specialists in these areas. **Container Corp.'s** net was down four per cent to $4,092,000, **Union Bag** was off 12 per cent to $3,790,000 and Mead also ebbed 12 per cent to $3,257,000. **Inland Container** managed to work out a four per cent increase to $1,596,000. Nine-month results of these companies ranged from a decline of

nine per cent for Container to one of 17 per cent for Union Bag.

West Virginia, aided by price increases in its October quarter, boosted profits 44 per cent to $3,172,000 on a two per cent rise in sales. For the fiscal year ended on October 31, however, net income was off 24 per cent to $8,330,000 although sales edged up to a new high of $251,600,000. The company said costs of starting up new facilities were responsible for the lower earnings.

Other packaging companies showing good gains included **Packaging Corp.,** where September quarter profits rose 30 per cent to $1,639,000, and Stone Container, where third-quarter net of $4,013,000 was up 43 per cent from a year earlier.

Fibreboard continued to show solid improvement from a rough first quarter, posting third-quarter earnings of $856,700, up 55 per cent from the 1960 period. This brought nine-month profits to $1,887,000, up three per cent.

Federal Paper Board fell back after holding steady in the second quarter. Third quarter results of $686,000 were off 10 per cent. Nine-month earnings of $2,100,000 were down 18 per cent. Albermarle's position weakened sharply as September quarter earnings dropped 72 per cent to $173,200 following a 41 per cent decline in the June quarter. A downward trend also continued at **Chesapeake** where third-quarter profits of $702,400 were off 40 per cent from the 1960 period, following declines of two per cent in the first quarter and 26 per cent in the second.

The food packagers were one of the few groups to show broad strength.

Sealright-Oswego Falls, which showed good improvement earlier in the year, surged forward again with a 44 per cent increase to $686,900. The increase, reflecting higher volume and lower shipping costs resulting from a new plant, brought nine-month results to $1,733,000, up 34 per cent.

Standard Packaging's earnings shot up 64 per cent in the third quarter, amounting to $1,071,000. Reflecting earlier weakness, nine-month earnings were off 21 per cent to $2,884,000.

Riegel continued to rebound from a poor first quarter, with September quarter profits of $742,000 topping year-ago results by 18 per cent. Nine-month earnings of $2,319,000 were 2.5 per cent behind the 1960 level.

Diamond National posted record earnings of $3,333,000 in the third quarter, an advance of 14 per cent from a year earlier. It cleared $9,849,000 in the first nine months, two per cent less than in the 1960 period.

Oxford paced the printing paper group with a third-quarter gain of 79 per cent to $855,400. The company attributed the improvement to economies resulting from its new pulping program. For the first nine months, profits were up 14 per cent to $2,439,000.

Allied Paper scored a sharp advance, with net income rising to $106,400 from a net loss of $43,900 in the same period last year. Earnings in the first nine months jumped to $942,300 from a meager $188,900 a year ago.

Nekoosa-Edwards continued firmly on the upside with third-quarter profits of $478,200 up 21 per cent from the 1960 period. Glatfelter's net of $363,600, however, was off 10 per cent from a year earlier.

S. D. Warren's earnings slipped in the second quarter and continued that way in the third, with net income easing 15 per cent to $1,026,000. Nine-month profits of $4,033,000 were down one per cent from a year earlier in contrast to a gain of five per cent at mid-year.

Start-up costs at its Oswego, N. Y., mill continued to hamper **Hammermill,** where third-quarter earnings dropped 28 per cent to $397,000, well under results in the first two quarters. Even so, the decline was 1961's lowest on a year-to-year basis, leaving nine-month profits at $1,485,000, down 39 per cent.

Bergstrom's quarterly profits dipped two per cent to $165,100, bringing nine-month results to $613,200, up ten per cent. Sorg reversed the downward trend of earlier quarters, posting a four per cent increase to $212,700. Nine-month earnings were down 32 per cent at $497,900.

In the newsprint field, **Great Northern's** net of $582,100 was better than in the second quarter but was down 15 per cent from the third quarter of 1960. Earnings in the forty weeks ended on October 8 were $1,913,000, barely ahead of a year ago.

Minnesota and Ontario had another rough quarter, with earnings down 40 per cent to $909,500. This placed nine-month profits at $2,647,000, off 44 per cent. Robert Faegre, president, said higher production and distribution costs had been compounded by reduced market demand and excess manufacturing capacity.

St. Croix was in the same boat as Great Northern, with quarterly earnings down 16 per cent to $253,900. Nine-month profits of $887,600 were down 21 per cent from a year earlier.

The Brown Co. posted its best results of the year with August quarter profits of $406,600 up 37 per cent from the 1960 period. This brought earnings for the first nine months to $786,900, a gain of 30 per cent from a year earlier. The company celebrated by declaring a 10 cent dividend, the first in two years.

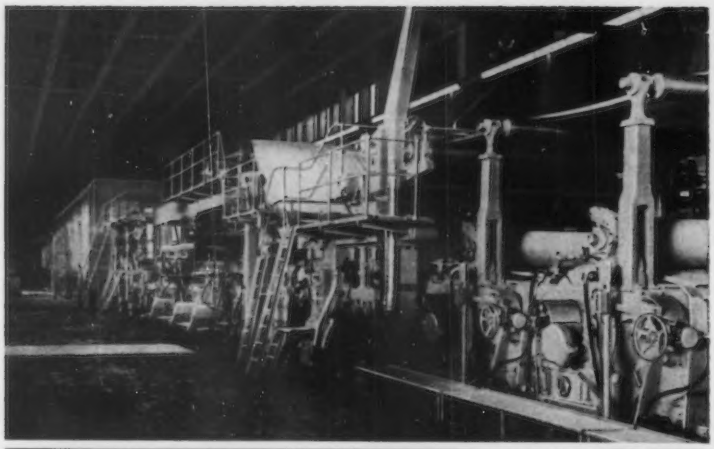
Other large pulp producers didn't do as well. **Rayonier's** earnings of $1,984,000 were off five per cent even though sales increased 10 per cent to $33,835,000. The third-quarter percentage decline, however, was the lowest of the year; nine-month profits of $5,717,000 were down 28 per cent.

Puget Sound Pulp's earnings were down four per cent in the third quarter, amounting to $1,089,000, but its nine-month results were off nine per cent at $3,315,000.

Specialty producers displayed a mixed pattern. **Fitchburg** was the strongest of the group with third-quarter profits up 44 per cent to $143,140 and nine-month results up 36 per cent to $492,000. Profits continued to rise sharply at **Crystal Tissue,** were third-quarter net was up 101 per cent to $63,800. **Keyes Fibre's** net was off 18 per cent to $420,800 while profits of **MacAndrew & Forbes** rose five per cent to $205,000. **Rogers Corp.** boosted third-quarter profits to $64,400, up 18 per cent, after sharp declines earlier in the year.

Two companies wrote their reports in red ink. **Consolidated Paper Co.** reduced its third-quarter deficit to $96,800 from $189,500 in the 1960 period but its nine-month loss rose to $539,400 from $91,900 a year earlier. **Whippany Paper Board,** which had posted record profits in the fiscal year ended in June, had a net loss of $29,100 in the September quarter in contrast to a $466,100 profit a year earlier. Conversion work on one of the company's largest machines and a twenty-day strike of power plant employes caused the deficit, according to Anthony Desiderio, president.

Downingtown, on the other hand, moved out of the red. A profit of $158,700 erased defiicits in the first two quarters and brought nine-month earnings to $62,700, compared with $54,900 in the 1960 period.



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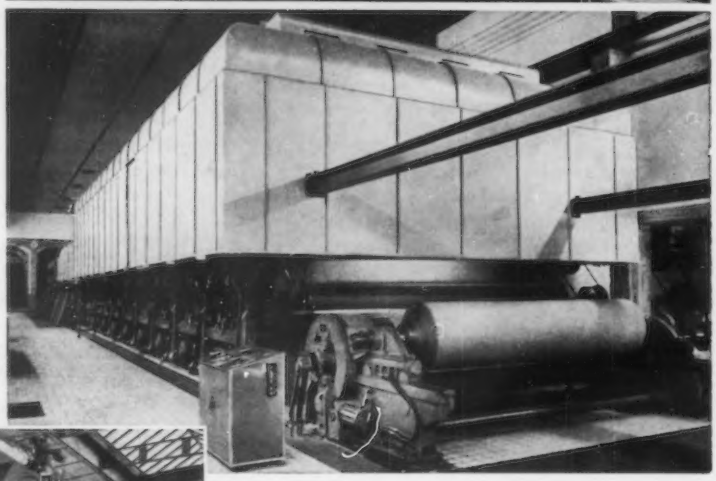

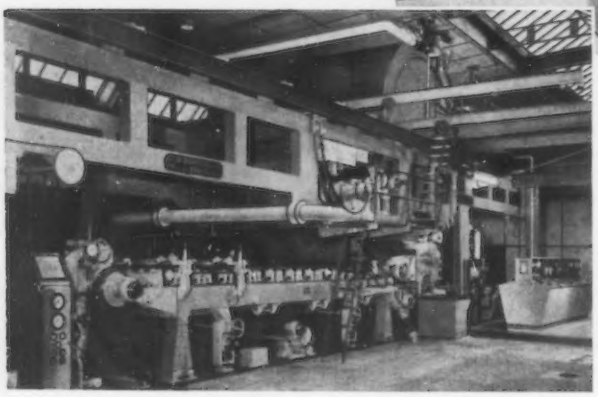

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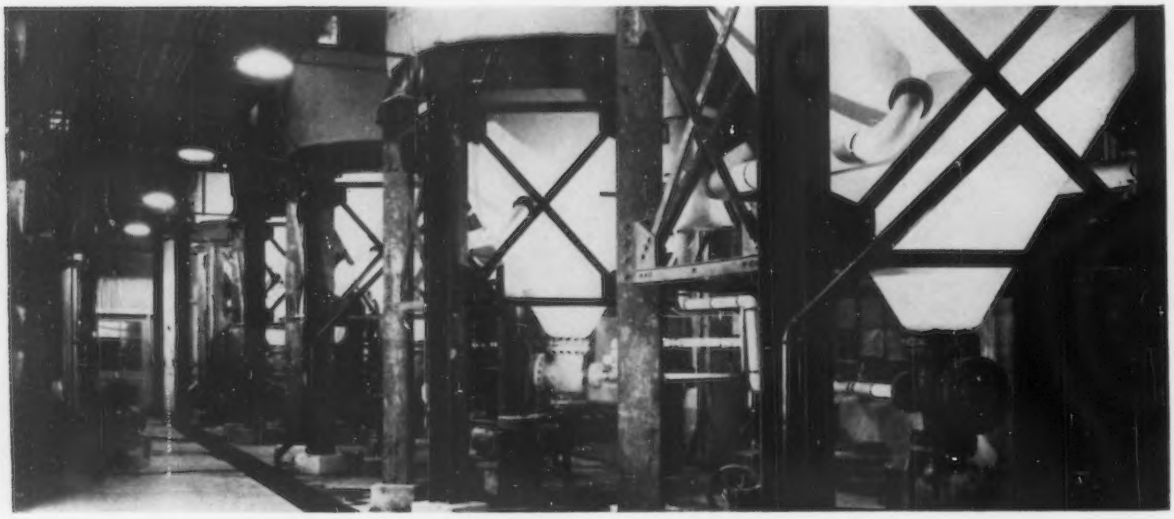
Armco metallurgists and welding engineers are active participants in the industry-wide effort to solve kraft and soda digester corrosion by the use of welded stainless steel overlays. Through their extensive knowledge of stainless and by special research on the problem, they have made significant contributions to its solution.



These include identifying causes of earlier failures, and helping develop new welding techniques and welding alloys that produce effective stainless steel linings.

Armco Research on stainless steel continues, as it has for more than 30 years, to help you produce better pulp and paper at lower cost. Let us work with you in determining how and where you can most effectively use stainless steels in your mill.

Just write us or contact your Distributor of Armco Stainless Steels. **Armco Division, Armco Steel Corporation, 2811 Curtis Street, Middletown, Ohio.**

ARMCO **Armco Division**

off for YOU

Get Armco Stainless Steels from these Steel Service Centers

New steels are born at Armco

(A) Sheets, Strip and Plates (B) Bars and Wire

AMERICAN STEEL & ALUMINUM CORP. Hartford, Conn. (AB)

AMERICAN STEEL & ALUMINUM CORP. OF MASS. Cambridge, Mass. (AB)

BROWN-WALES COMPANY Cambridge, Mass.—Auburn, Maine—Worcester, Mass. (AB)

CENTRAL STEEL & WIRE COMPANY Chicago, Ill.—Cincinnati—Detroit—Milwaukee (AB)

CHICAGO STEEL SERVICE COMPANY Chicago, Ill. (AB)

CLEVELAND TOOL & SUPPLY COMPANY Cleveland, Ohio (B)

THE CONGDON AND CARPENTER COMPANY Providence, R. I.—Fall River, Mass.—Natick, Mass. (AB)

C. A. CROSTA, INC. Denver, Colo. (A)

DUCOMMUM METALS & SUPPLY COMPANY Los Angeles, Calif.—Berkeley—Phoenix—San Diego—Seattle (AB)

EDGCOMB STEEL & ALUMINUM CORP. Hillside, N. J. (AB)

EDGCOMB STEEL COMPANY Philadelphia, Pa.—Charlotte, N. C.—Greensboro, N.C.—York, Pa. (AB)

ESCO CORPORATION Portland, Oregon—Denver—Emeryville, Calif.—Eugene, Oregon—Honolulu—Los Angeles—Seattle—Spokane—Vancouver, B. C. (AB)

PETER A. FRASSE & COMPANY, INC. New York, N. Y.—Buffalo—Hartford—Lyndhurst, N. J.—Philadelphia—Syracuse (AB)

FIRTH BROWN STEELS LTD. Montreal, P. Q.—Toronto (AB)

GATE CITY STEEL, INC.—OMAHA Omaha, Nebr.—Columbus, Nebr. (AB)

INDUSTRIAL STAINLESS STEELS, INC. Cambridge, Mass.—Buffalo, N. Y. (B)

EARLE M. JORGENSEN COMPANY Los Angeles, Calif.—Dallas—Denver—Honolulu—Houston—Oakland—Phoenix—Seattle—Tulsa—Wichita (AB)

MAPES & SPROWL STEEL COMPANY Union, N. J. (AB)

METAL GOODS CORPORATION St. Louis, Mo.—Dallas—Denver—Houston—Memphis—New Orleans—N. Kansas City, Mo.—Tulsa—Wichita (AB)

MONCRIEF-LENOIR MFG. COMPANY Houston, Texas—Dallas—Harlingen—Lubbock—San Antonio—Temple (AB)

MORRISON STEEL COMPANY New Brunswick, N. J. (AB)

THE ORLEANS STEEL PRODUCTS COMPANY, INC. New Orleans, La. (A)

WILLIAM M. ORR COMPANY, INC. Pittsburgh, Pa. (AB)

PAPER-CALMENSON & COMPANY St. Paul, Minn. (A)

SEABOARD STEEL & IRON CORP. Baltimore, Md. (B)

SENECA STEEL SERVICE, INC. Buffalo, N. Y.—Jamestown, N. Y. (AB)

SOUTHER STEEL & ALUMINUM COMPANY St. Louis, Mo. (A)

J. M. TULL METAL & SUPPLY COMPANY, INC. Atlanta, Ga.—Birmingham—Greenville, S. C.—Jacksonville—Miami—Tampa (AB)

VIKING STEEL COMPANY Cleveland, Ohio (AB)

VORYS BROTHERS, INC. Columbus, Ohio (AB)

YORK CORRUGATING COMPANY York, Pa.—Washington, D. C. (A)

PJT NEW LITERATURE

Ball Valves

Details the working parts and applications of a competitively priced valve. Included are photos showing how the cartridge, containing all working parts, can be slipped out the bottom, in one piece, while the valve body remains in-line. Disassembled working parts of the valve and cartridge also are described, shown in photos and keyed in a diagram. Details concerning pressure and temperature ratings, sizes and other pertinent information are also given. Bulletin ADB-1001X. Crane Co., Industrial Products Group, 4100 South Kedzie Avenue, Chicago 32, Ill.

Bubble-Tight, Dual-Seal Bronze Globe Valves

Contains large cross-sectioned view of the valve, with call-outs. All pertinent data on dual-sealing are given. Pressure ratings, sizes, and material specifications of 12 valves now manufactured with dual-sealing design are listed. Valves come in screwed flanged and Walseal ends. 6 pp. Circular. Walworth Co., Valves & Pipe Fittings, 750 3rd Ave., New York 17, N. Y.

Disston Custom Steel Parts

Describes complete engineering and fabricating services for the production of custom steel tools, parts and assemblies to meet customers' specifications. Among the many specialized tools in Disston's production facilities are presses up to 300-ton capacity; grinding facilities for plates up to 108 by 75 inches in width; and gas-fired hardening furnaces for pieces as large as 150 by 75 inches. One surfacing, edging and beveling grinding unit is equipped with a 130 inch chuck for special work. Brochure. Disston Division, H. K. Porter Co., Inc., Porter Bldg., Pittsburgh 19, Pa.

Emerson Triple Attack Pulper

Describes the construction and performance of the pulper. Contained are dimensions, horsepower requirements, rotor diameters, cycle time, tonnage capacities and other details of the eight different size commercial units. Illustrations and text describing the rotor and the principle of triple attack defibering are also included. Bulletin No. D-615. The Emerson Manufacturing Co., Div. of John W. Bolton & Sons, Inc., Lawrence, Mass.

(Continued on page 56)

ideas and news:

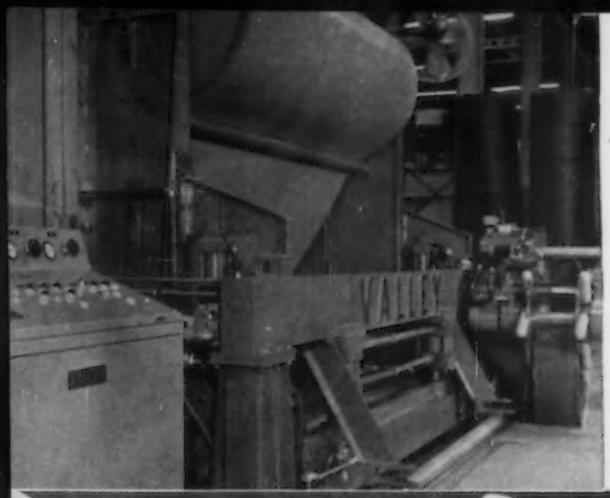
Open motor shrugs off everything but work: This 5-hp SUPER-SEAL motor performs with unfailing dependability . . . even though covered with a foamy pulp mixture. Twice a day, it gets cleaned — with a hose. POXEAL insulation resists moisture, dust and most contaminants . . . enabled this open motor to replace a TEFC motor that had to be frequently rewound.

Control centers cut costs: You save space, simplify wiring and reduce inspection and maintenance expenses with new Allis-Chalmers low-voltage motor control centers. Plug-in terminal blocks and drawout construction cut inspection time by making it quick and easy to withdraw or remove control units. Pushbuttons and pilot lights are mounted on the removable frames to eliminate failures common with hinged wiring. Special connectors make it impossible for bus connections to loosen. Extra-heavy bus bracing makes additional bracing unnecessary when you add capacity.

Which of these productive ideas could be working for you?

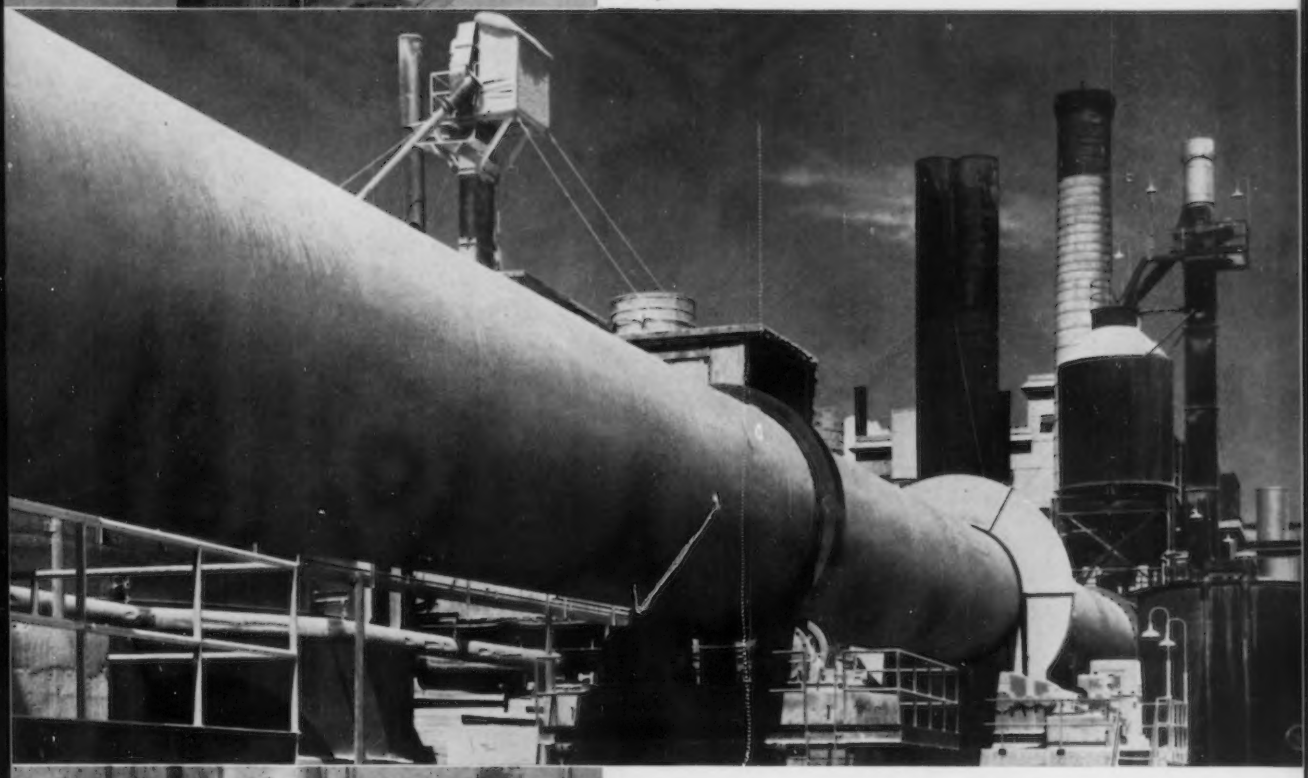
An open motor that shrugs off a soaking. A system that wraps rolls automatically. A pump that instantly matches flow to demand. These examples demonstrate the extra value that is a standard with A-C . . . the greater efficiency and the added productivity which are yours when you buy A-C products, systems and services. Call your Allis-Chalmers representative for details on A-C "worth-more" features. Or write Allis-Chalmers, Industries Group, 903 South 70th Street, Milwaukee 1, Wisconsin.

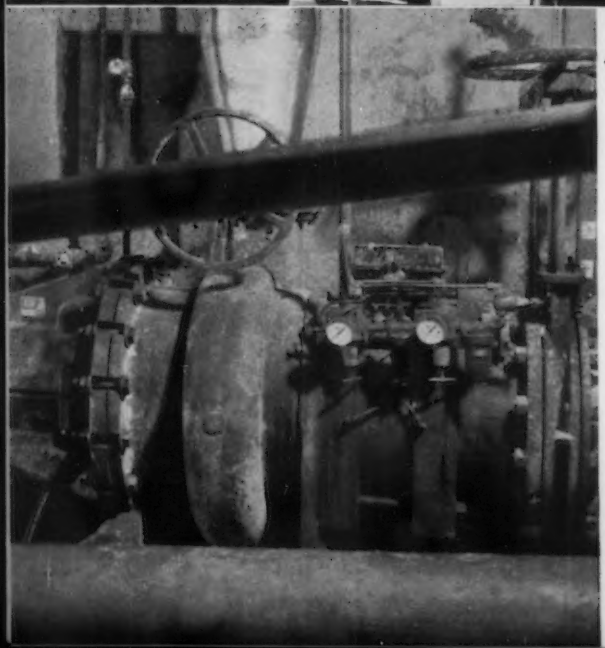
Super-Seal, Poxeal, and ACAP are Allis-Chalmers trademarks.



New "pushbutton" system wraps a roll-a-minute: Valley Iron Works Corporation (an A-C affiliate) has developed an automatic system that can wrap more than 60 rolls an hour. It cuts wrapping paper to proper size, applies it to the roll, and crimps the ends for application of headers. The system can handle rolls of varying sizes in succession — face lengths of 7 to 112 inches, diameters from 15 to 42 inches — other sizes are available.

This 275-ft "oven" bakes a batch of savings: This giant Allis-Chalmers rotary kiln gulps in huge quantities of waste lime sludge . . . converts it into usable lime of uniform high quality. Because of a unique feeding system, this unit can process both sludge and raw limestone (if needed) simultaneously.





***ACAP* pump regulates flow instantly** . . . without valves or varying pump speed. Proven ACAP (Adjustable Capacity, Adjustable Pressure) principle with internal pneumatic control automatically matches flow to demand. Regulation of flow through changing impeller clearances eliminates binding, plugging, saves power, allows systems to operate at high efficiency regardless of demand.

ALLIS-CHALMERS PRODUCTS FOR THE PAPER INDUSTRY: Look to Allis-Chalmers for compressors; controls; earth-moving equipment; industrial systems; lift trucks; motors; papermaking machinery; pumps; rectifiers; electrical generation and distribution equipment; tractors; transformers; unit substations; valves; water-conditioning equipment. A-1544

ALLIS-CHALMERS

NEW LITERATURE

(Continued from page 53)

Special Tensile Tester Grips

Describes seven different sets of tensile tester grips including the Clark zero span grips and the well-known Tappi grips. Each set of grips is designed for a particular application in the field of tensile strength testing. They may be used with all models of the Thwing-Albert electro-hydraulic tensile strength testers, or with any other tensile tester. Bulletin 101. Thwing-Albert Instrument Co., Penn Street and Pulaski Ave., Philadelphia 44, Pa.

Integral Type Positioner

Describes Conoflow's Model J a compact, top-mounted, integral-type positioner which can be used with pneumatic cylinder, springless diaphragm or spring and diaphragm actuators, operates on the force balance principle, and has a two-stage pilot. Details of operation and complete specifications and dimensions are given. Data Sheet 105, Conoflow Corp., 2100 Arch Street, Philadelphia 3, Pa.

Principles of Mount Hope Roll

Presents results of tests showing (1) how the roll is made; (2) what it does; (3) how it does it. There are two basic types, the fixed bow and the vari-bow. Each unit is discussed separately but the principles outlined apply to both types. 11 pp. Bulletin. Mount Hope Machinery Co., 15 5th St., Taunton, Mass.

Top-Entry Ball Valves

Describes ball valves for pressure or vacuum applications in liquids, gases and slurries. Information includes dimensions of six valve sizes, pressure ratings, and design features and advantages. Operation is detailed in cutaway views. 1 p. Circular 612MF. Lunkenheimer Co., Cincinnati 14, Ohio.

"U" Type Pumps

Describes and illustrates the complete line of Hills-McCanna "U" type pumps for continuous metering and proportioning of small volume flows. Capacities catalogued range from 0.05 to 34.0 gallons per hour per feed. Operating pressures are from 125 to 5000 p.s.i. 16 pp. Catalog #500. Hills-McCanna Co., 400 Maple Ave., Carpentersville, Ill.

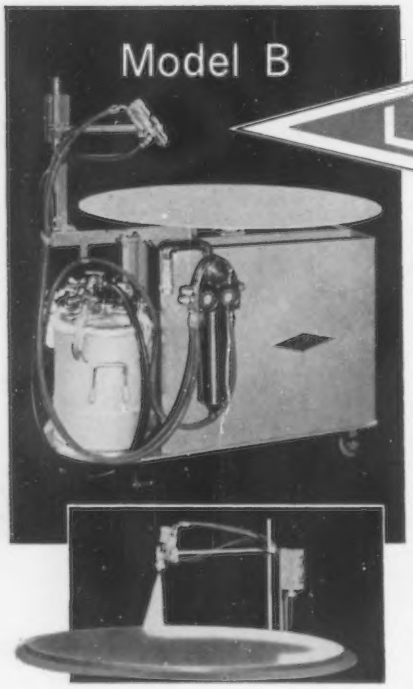
Materials of Construction

Gives full information on fourteen metals and alloys most frequently specified for pump construction. In addition, a complete discussion on ductile iron, its increasing usage in place of cast steel is included. Bulletin 765.8. Goulds Pumps, Inc., 230 Black Brook Rd., Seneca Falls, N.Y.

Web Offset Handbook

Provides up-to-date source of information on the advantages and savings available through web offset printing, the booklet is also intended as a comprehensive reference work. Describes pressroom problems, types of web offset presses, presses controls, and auxiliary equipment. Two chapters concern paper. The first discusses paper waste and the reasons for it, types of paper and basic requirements for web offset printing. The second considers paper problems encountered on the press and suggests solutions. Also recommendations for efficient ordering of roll paper stock and a glossary of web offset terms are given. Part of Kimberly-Clark's "better printing through better planning" series, the booklet was written by K. L. Wallace, a staff service engineer in the corporation's product specifications and quality conformance department. 48 pp. Kimberly-Clark Corp., Neenah, Wis.

Announcing a **NEW** Design!
AUTOMATIC Head Gluer



- **Pushbutton simplicity**
- **Applies glue automatically**
- **A time-saver and glue-saver**

The LAMB Automatic Head Gluer glues heads up to 72" diameter—*fast, automatically!* Takes 6 to 7 seconds per head . . . applies a *thin*, economical layer of glue. Makes a better looking package . . . eliminates danger of glue dripping on roll ends. Available with one or two spray heads, depending on requirements.

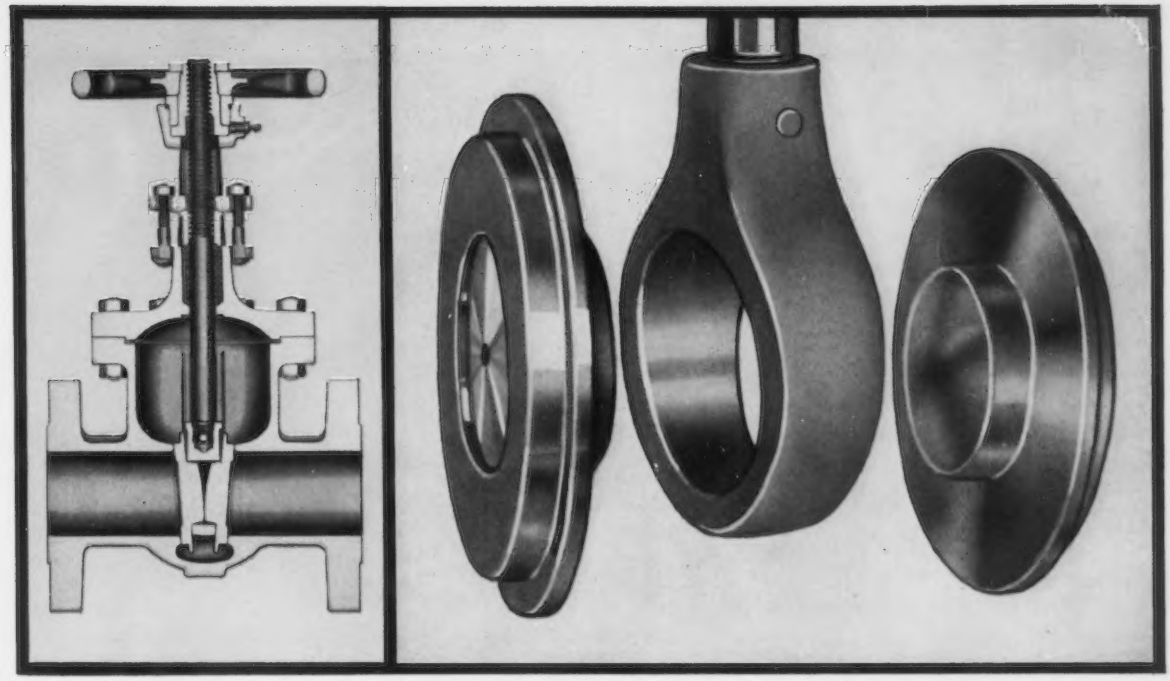
WRITE—let us know your head gluing problems. Folder available without obligation.

Since 1906

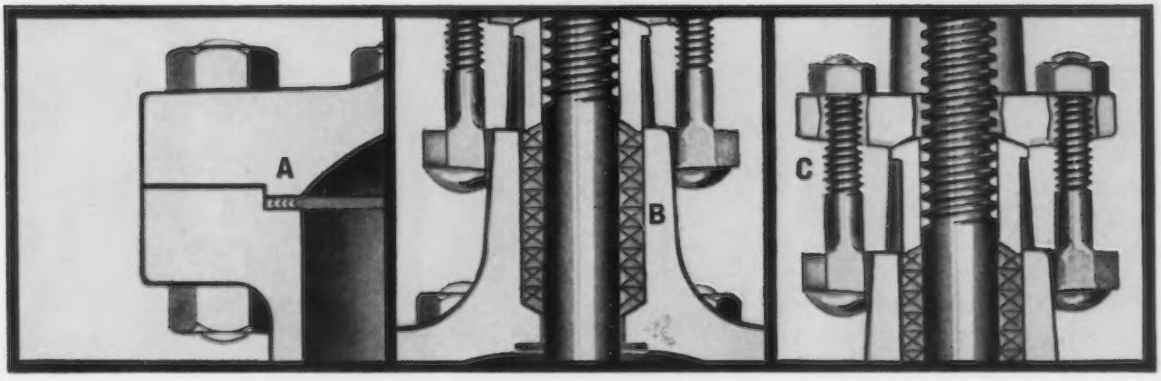
LAMB-GRAYS HARBOR CO., Inc.

HOQUIAM, WASHINGTON, U.S.A.

Phone: GEneral 8-1000



New 300 & 600-Pounders extend Crane line of stainless steel gate valves. Feature unique, free rotating, split-wedge disc.



The unique Crane split-wedge disc design features two identical disc halves, fitted back to back in a carrier that is fastened to the valve stem. The moment the lower portions of the disc halves contact the seats, the carrier exerts uniform pressure on the beveled sides of both disc trunnions, forcing the disc halves outward against the seats. This results in a perfect seal and long trouble-free valve life. Free rotation of disc halves prevents wear and galling, keeps seat faces clean.

Other quality features include **(A) Recessed, spiral wound bonnet gasket** which permits face to face abutment of body and bonnet flange. Provides predetermined gasket loading. **(B) Extra deep stuffing box** for tightness and long life. **(C) Thru stud-bolts** for easy upper valve servicing.

There's a wide choice of Crane Stainless Steel Gate Valves in 18-8 SMo or CRANELOY 20 in 150, 300 and 600 Pound Classes with screwed or flanged ends, temperatures up to 800 F. (300 & 600 Pound) . . . up to 500 F. (150 Pound).

For complete details contact your Crane Distributor. Or write to Crane Co., Dept. S, Industrial Products Group, 4100 South Kedzie Ave., Chicago 32, Illinois. In Canada: Crane Ltd., 1170 Beaver Hall Square, Montreal.

AT THE HEART OF HOME AND INDUSTRY

CRANE

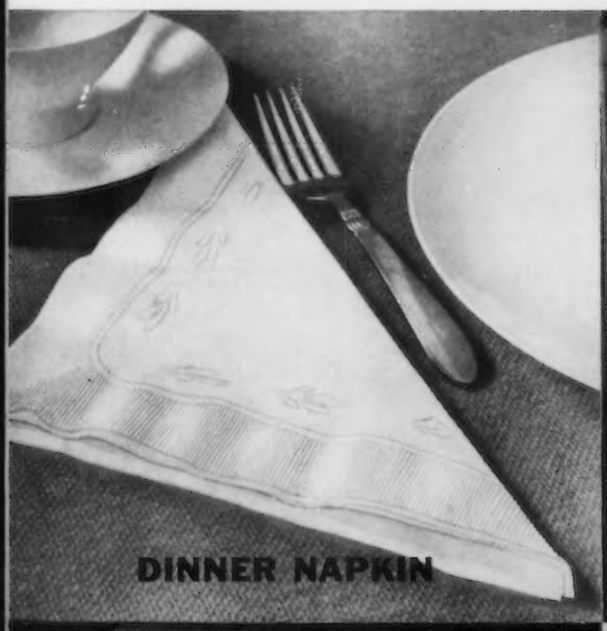
VALVES AND PIPING
ELECTRONIC CONTROLS
PLUMBING
HEATING • AIR CONDITIONING

Eight papers... improved by a

Name your paper—and Alberta HI-BRITE Pulp will help you make it better! Now proved in more than one hundred North American paper mills, Hi-Brite is truly the modern pulp for modern, quality papers.

Why does Hi-Brite do so much more than ordinary pulps? *First*, it's produced exclusively from northern spruce and lodgepole pine. *Second*, Hi-Brite pulp is "cold-blown" from Kamyr continuous digesters to preserve the bonding strength of the long, thin fibers. *Third*, Hi-Brite's ultra-modern bleaching process actually improves the inherent strength of the unbleached fibers.

Hi-Brite . . . and Hi-Brite alone . . . has this



single pulp—Alberta Hi-Brite®!

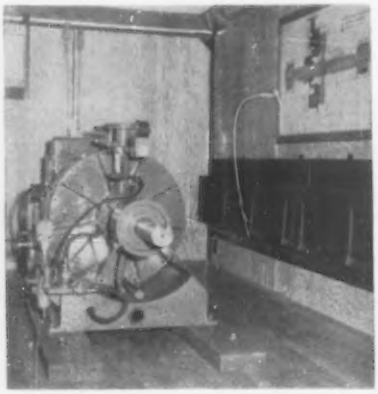
unique combination! The result—a uniform pulp of gleaming whiteness with outstanding bonding properties!

Get the full story on Alberta Hi-Brite Bleached Sulphate Pulp... and the advantages it offers your paper-making operation. St. Regis Paper Company, 150 East 42nd Street, New York 17, N. Y.

KRAFT DIVISION

St.Regis PAPER COMPANY

PJT NEWS OF SUPPLIERS



Sprout-Waldron Co., Inc., Muncy, Pa., is showing its new pressurized floating disc stock preparation refiner to mills throughout the United States and Canada, which will now have an opportunity to view a 20-inch production model machine mounted in the van as pictured at left.

R. E. Shook, manager, Pulp and Paper Mill Division, states that the truck equipped with heating and air conditioning units will be on the road constantly for the next 12 months visiting mills so that managing and operating personnel will have the benefit of seeing the refiner first-hand. It is expected that a better appreciation of the operating and control features will be obtained and that the mill operators will be better able to appreciate the benefits that these stock preparation refiners will bring to their mills.

Taylor-Wharton Co., division of Harsco Corp., High Bridge, N. J., has appointed Robert A. Herstine as sales representative for the southern New York — northern Pennsylvania territory.

Mr. Herstine graduated from Penn State University in 1952 and was previously employed by Bethlehem Steel Co. and Bethlehem Fabricators.

Taylor-Wharton manufactures manganese and alloy steel castings and products for the mining, paper and construction industries.

J. O. Ross Engineering Div'n of Midland-Ross Corp. will market exclusively the new and revolutionary Teknika Sonic Defoaming Systems to the pulp and paper industries.

Nineteen sixty-one marks the 40th anniversary of the J. O. Ross Division. Its sale, engineering and service organization has served the paper industry for 40 years. In its position as leader in the pulp and paper machinery industry, the Ross Division has long been keenly aware of the foam problem in those industries.

"The new and revolutionary Teknika Sonic Defoaming process appeared to be an ideal answer to the problem," said Robert J. Jacobs of Midland-Ross, "And a careful examination of the Teknika systems now in operation thoroughly substantiated our initial opinion. Our J. O. Ross Division is in an excellent posi-

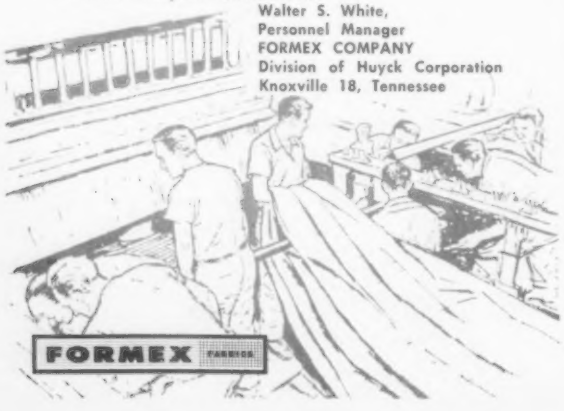
Opportunities in Sales Engineering

Manufacturer of the new Fourdrinier Forming Fabrics and Paper Machine Dryer Fabrics has Sales Engineering openings in the major papermaking regions of the United States.

This revolutionary development represents eight years of research, and has created a new technology in papermaking. Recent technological breakthroughs have broadened its successful application to a wide variety of machine conditions and paper grades, presenting an outstanding opportunity for personal growth and professional advancement.

Requirements: Engineering background, and experience selling technical products to papermakers.

Write in complete confidence to:
Walter S. White,
Personnel Manager
FORMEX COMPANY
Division of Huyck Corporation
Knoxville 18, Tennessee



PRICE & PIERCE LTD.

WOODPULP

PAPER

LONDON
27 CLEMENTS LANE

NEW YORK
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MONTREAL
SUN LIFE BLDG.

New digital draw-speed indicator slashes machine set-up time

speeds correction of in-process variations

Greatly reduces machine set-up time. The new digital draw-speed indicator provides accurate indication of machine speeds and draw for each paper grade. When changing grades, draws are pre-set to those used when the grade was last run. The sheet can be established across the machine by instrumentation without further draw adjustment, completely eliminating trial and error methods. Based on mill operational data, this draw-speed equipment permits a 25% decrease in downtime on grade changes.

Pinpoints location and cause of machine variations. The new digital draw-speed indicator continually monitors speeds and draws—allows you to swiftly locate and trouble shoot the cause of section swinging. In addition, it isolates the source of trouble to either regulator or mechanical problems. Result: a substantial reduction in broke and off-grade sheet is realized.

Photo shows draw-speed indicator installed at the Pensacola, Florida plant of the St. Regis Paper Company.

Unexcelled accuracy and versatility. The completely transistorized Westinghouse digital draw-speed indicator system is free of drift errors. It allows readings on up to 30 different machine sections with a simple selector switch. It is available with a print-out data logging system to record machine operation. Modular construction is used to facilitate inspection or part replacement if necessary. A simple screw adjustment within the instrument swing-out panel will recalibrate the unit for up to 30% roll diameter changes.

For more information, contact your Westinghouse representative or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.

You can be sure . . . if it's Westinghouse.

J-40539

Westinghouse

tion to bring these systems to the industry quickly, with the largest and best developed engineering and sales organization on the continent. Our experience to date indicates that Teknika Sonic Defoaming Systems could be a significant contribution to the reduction of national stream pollution as well as a means to lower operating expenses and improve the efficiency of the pulp and paper industries."

Formex Co. of Canada's new plant in Kentville, N. S., Canada, which began operation late this fall. This plant will manufacture the company's plastic forming fabric for the Canadian paper industry's requirements which were formerly met by imports from the parent plant in the United States.

J. F. Longo, Jr.

W. R. Furbeck

Paper Mill Suppliers, Inc., Kalamazoo, Mich., exclusive distributor for Dri-Tuft (needled) and Dri-Weave (woven) dryer felts manufactured by the Albany Felt Co., has announced the appointment of Joseph F. Longo, Jr., as sales engineer.

Mr. Longo, previously associated with Albany Felt, will serve the New York and New England areas.

Formex Co., division of Huyck Corp., announces the promotion of Warren R. Furbeck to manager of mechanical applications. Mr. Furbeck came to Formex from the Kimberly Clark Corp., where he was paper machinery design engineer. With Formex, he is responsible for engineering requirements relative to new developments in fourdrinier operation.

His department provides special engineering services to papermakers, principally in the field of machine design, made possible by new fourdrinier operating characteristics resulting from the use of the Formex forming fabric.

Mr. Furbeck also is responsible

"Known by the Reliability of its Service as well as the Quality of its Product"
GREAT EASTERN
GE
Quality
Service
Reliability
GREAT EASTERN
PACKING & PAPER STOCK CORP.
53-01 GRAND AVENUE, MASPETH 78, NEW YORK • EVERGREEN 6-2565
STATION & HALLECK STREETS, BOSTON 20, MASS. • GARRISON 7-5720
SALES OFFICE: 250 PARK AVENUE, NEW YORK 17, NEW YORK • YU-KON 6-7840

for coordinating the efforts of the Formex Co., with the Huyck Equipment Co., division of Huyck Corp., supplier of stainless box covers and bowed bars, used with the Formex forming fabric, as well as with other paper mill equipment manufacturers.

Extremultus, Inc., Englewood, N. J., has appointed Eugene J. Brown to the newly created post of Western regional manager. He will be based in Portland, Oregon.

J. F. Ginter

Mount Hope Machinery Co. of Taunton, Mass., has opened a new plant in Appleton, Wis., for the manufacture, sales and service of its full line of Mount Hope bowed rolls and other web control equipment for the paper, converting, plastics and textile industries. James F. Ginter, Mount Hope's sales engineer for northern Illinois, western Michigan, Wisconsin, Iowa and Minnesota, will move his offices to the plant from the present Chicago location, in an attempt to provide on-the-spot service.

John W. Bolton & Sons, Inc., and The Emerson Manufacturing Co. has named Lee H. Flanders sales representative for the Pennsylvania, New Jersey and Delaware territory.

For the past year and a half, Mr. Flanders has been covering the California territory for the Lawrence, Mass., manufacturer.

Prior to joining Bolton-Emerson, he was a field sales representative of the Cities Service Oil Co. In addition, he has been associated with the Hudson Pulp and Paper Co. and the U. S. Steel Corp.

Mr. Flanders graduated from Temple University with a B. S. degree in business administration.

Keep your eye on our Classified Advertising Section

Prices of Fibers

MARKET WOOD PULP

FOURTH QUARTER CONTRACT PRICES PER SHORT AIR-DRY TON

Delivered Basis

	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$82.50/ 90.00	$82.50/ 90.00	$90.00/ —	$90.00/ —	$90.00/ —
Bleached Gw'd.	97.50/100.00	97.50/100.00			
Kraft, Blchd.	‡140.00/150.00	‡140.00/150.00	150.00/ —	150.00/ —	150.00/ —
Kraft, Blchd. Hdwd.	135.00/140.00		140.00/ —		
Kraft, Semi-bleached.	130.00/140.00				
Kraft, Unbl.	117.50/125.00	125.00/ —	125.00/130.00	125.00/ —	
Sulphite, Blchd.	‡135.00/140.00	‡135.00/140.00	140.00/ —	140.00/ —	140.00/ —
Sulphite, Bl. Hdwd.	135.00/ —				
Sulphite, Unblchd.	125.00/ —	125.00/ —	125.00/ —	125.00/ —	125.00/ —
Sulphite, Unb'l. Gl'sn.		140.00/ —	134.00/ —		
Soda, Blchd.	130.00/135.00	130.00/135.00			

‡ Depending on Brightness.

COTTON LINTERS

F.O.B. OIL MILLS PER CWT

WEEK ENDED NOVEMBER 28

	Atlanta	Memphis	Dallas	Los Angeles
Grade 1	n.a.	n.a.	n.a.	n.a.
2	$8.00/7.75	n.a.	$9.00/8.50	$8.25/8.00
3	7.75/7.25	$8.25/7.50	8.00/7.50	7.50/7.25
4	7.25/6.75	7.25/7.00	7.00/6.75	7.00/6.50
5	7.25/6.75	6.75/6.50	6.75/6.50	6.00/5.75
6	6.75/6.25	6.00/ —	6.25/6.00	5.50/ —
7	6.25/5.75	6.00/ —	6.00/5.75	n.a.

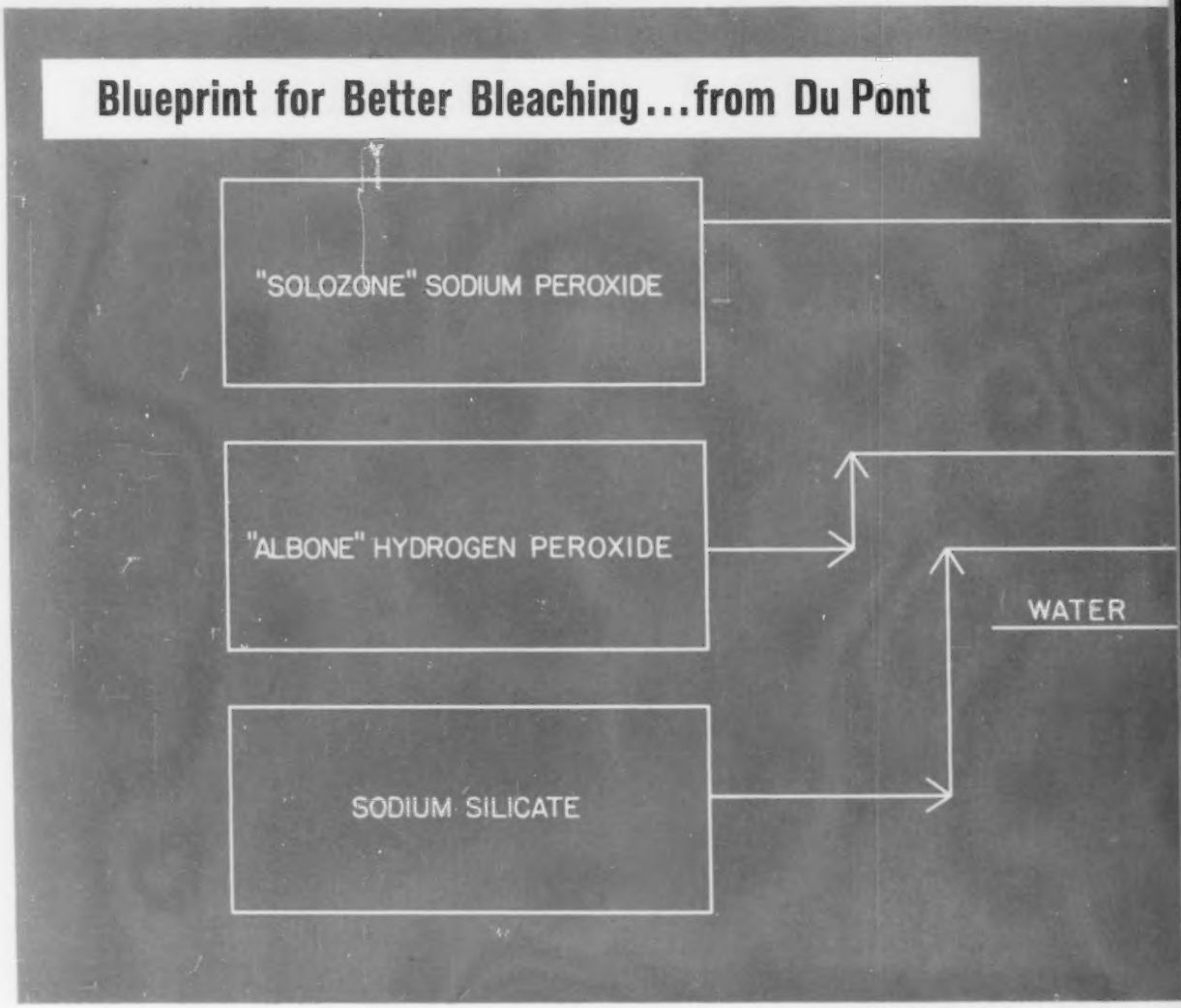
WASTE PAPER MARKET

Mill Prices, f.o.b. Trucks Shipping Point — Includes Brokerage

These quotations are a partial indication of the price range on volume tonnage in each market on the date specified, as gathered from major dealers and brokers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal.

	New York December 4	Boston December 4	Chicago December	Los Angeles December
No. 1 Mixed Paper	$ 12.00/ 13.00	7.00/ 10.00	6.00/ —	12.00/ —
No. 1 News	16.00/ 18.00	— / 14.00	16.00/ —	15.00/ —
Overissue News (Lg. size)	21.00/ 24.00	12.00/ 14.00	21.00/ —	18.00/ —
Mill Wrappers	19.00/ 22.00	10.00/ 12.00	11.00/ —	13.00/ —
Old Corrugated Containers	22.00/ 25.00	18.50/ 19.00	20.00/ —	16.00/ —
Super Resorted Kraft Paper	35.00/ 40.00	— / —	30.00/ —	50.00/ —
New Double Kr. Ld. Corr. Cuts	27.50/ 30.00	30.00/ 32.50	27.50/ —	27.50/ —
(Semi-chem. medium)	45.00/ —	40.00/ 45.00	42.50/ —	— / —
New 100% Kraft Corr. Cuts	42.50/ 47.50	— / —	50.00/ —	— / —
New Br. Kraft, Env. Cuts	65.00/ 70.00	65.00/ 75.00	45.00/ —	37.50/ 40.00
New Br. Kr. Bag Waste Prntd.	50.00/ 55.00	50.00/ 60.00	45.00/ —	35.00/ —
New Br. Kr. Bag Waste Unprintd.	55.00/ 60.00	60.00/ 65.00	55.00/ —	45.00/ 47.50
No. 1 Groundwood Shvs.	30.00/ 35.00	20.00/ 25.00	15.00/ —	25.00/ —
White Newsblanks	50.00/ 55.00	40.00/ 45.00	30.00/ —	55.00/ —
No. 1 Soft White Shvs.	60.00/ 65.00	55.00/ 65.00	50.00/ —	75.00/ —
Super Soft White Shvs.	65.00/ 75.00	70.00/ 80.00	60.00/ —	— / —
Hd. White Shvs.	85.00/ 90.00	80.00/ 90.00	75.00/ —	80.00/ —
Hd. White Env. Cuts	95.00/100.00	100.00/105.00	80.00/ —	103.00/ —
Col. Tab. Cards	42.50/ 45.00	42.50/ 45.00	47.50/ —	35.00/ —
Manila Tab. Cards	62.50/ 65.00	62.50/ 65.00	70.00/ —	75.00/ —
No. 1 Col. Ledger	35.00/ 40.00	32.50/ 35.00	40.00/ —	23.00/ —
White Ledger	55.00/ 57.50	50.00/ 55.00	50.00/ —	40.00/ 45.00
Mixed Book & Mag.†	14.00/ 15.00	— / —	8.00/ —	/ —
No. 1 Books‡	15.00/ 20.00	18.00/ 22.00	22.50/ —	8.00/ 13.00

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% of groundwood.



A typical automatic make-up system for peroxide solution using a combination

How you can use a combination of Du Pont Peroxides to

Practically all groundwood bleacheries have found that a combination of hydrogen and sodium peroxides cuts bleaching costs. The reason—combination formulas eliminate the use of caustic soda.

How is this possible? Because of the bleaching chemistry involved. When hydrogen peroxide is used alone, substantial quantities of caustic soda must be added to assure effective bleaching. But when sodium peroxide is part of the formula, caustic soda is formed and additional caustic isn't needed. Sufficient sodium peroxide is dissolved to supply the necessary caustic, hydrogen peroxide is added to complete the peroxygen balance and the bleaching formula is now ready to use.

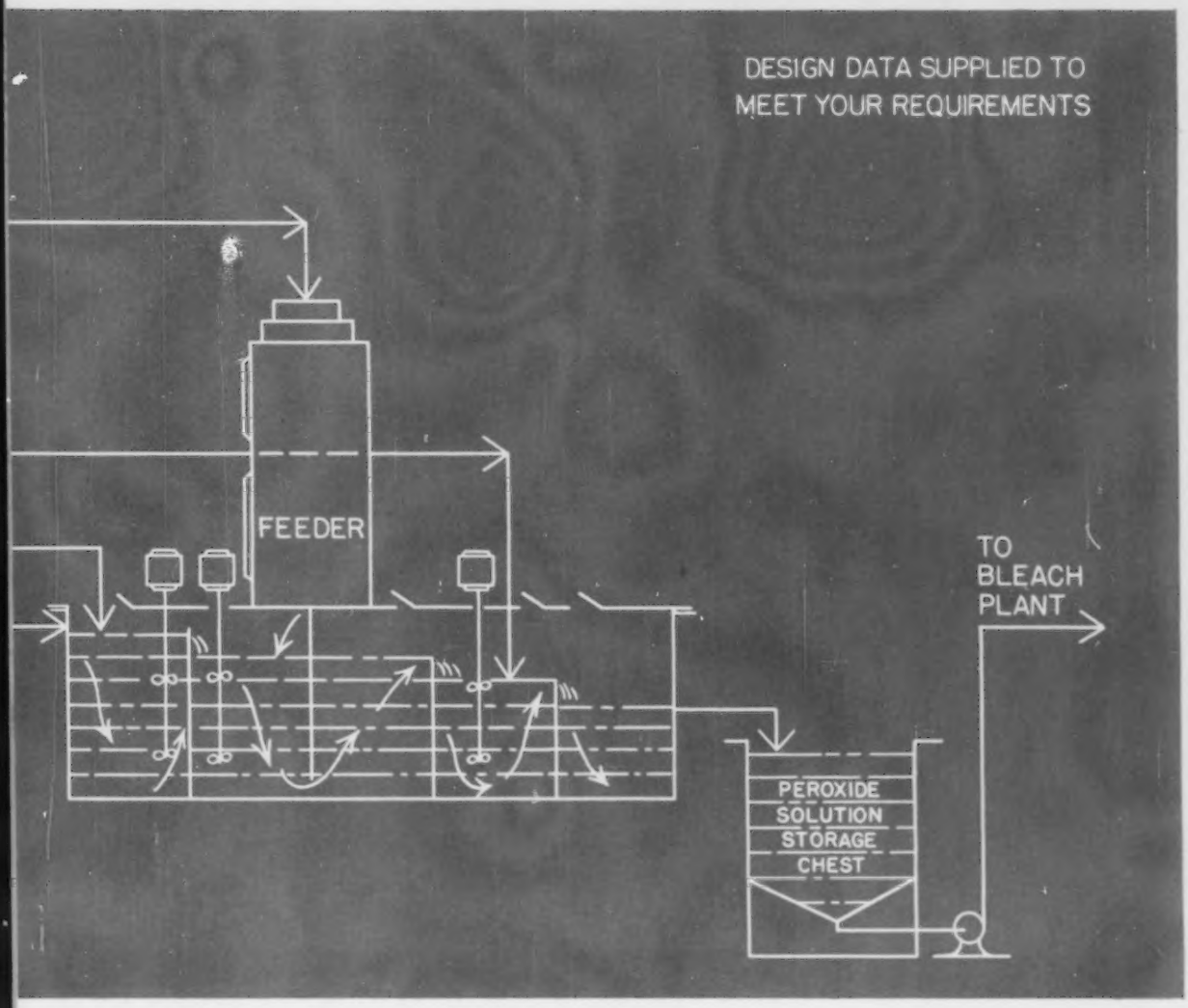
The tables show typical hydrogen peroxide formulas for one-stage tower bleaching of groundwood and equivalent formulas using a combination of peroxides. Savings from use of the combination formulas run from $.90 to $1.00 a ton for normal brightness and from $1.15 to $1.25 where premium brightness (up to 75) is required.

CONTACT ONE OF THESE MEN FOR INFORMATION:

Midwest Area
W. L. Lilke, Chicago, Ill.—INdependence 3-7250

New York & Boston Area
C. R. Lombard, New York, N. Y.—LOngacre 3-6440

Or call: A. T. Hawkinson, Wilmington,



of "Solozone" sodium peroxide and "Albone" hydrogen peroxide.

save up to $1.25 a ton over hydrogen peroxide alone

ONE-STAGE TOWER PROCESS FOR PREMIUM BRIGHTNESS

A. USING COMBINATION OF PEROXIDES

5.0% silicate
1.5% "Solozone" sodium peroxide
1.25% "Albone" 50 hydrogen peroxide

B. USING HYDROGEN PEROXIDE ONLY

5.0% silicate
1.5% NaOH
2.5% "Albone" 50 hydrogen peroxide

ONE-STAGE TOWER PROCESS FOR NORMAL BRIGHTNESS

A. USING COMBINATION OF PEROXIDES

5.0% silicate
1.2% "Solozone" sodium peroxide
0.7% "Albone" 50 hydrogen peroxide

B. USING HYDROGEN PEROXIDE ONLY

5.0% silicate
1.2% NaOH
1.7% "Albone" 50 hydrogen peroxide

Du Pont technical representatives will gladly show you how a combination of peroxides can save you money in your bleaching operation and suggest a process layout (such as the one shown above) to fit into your present plant layout. Contact your nearest representative listed below, or write: Du Pont, Electrochemicals Department, Wilmington 98, Delaware.

West Coast Area
P. E. Kiefer, Portland, Oregon—CApital 7-1281

Southern Area
R. W. Hammond, Charlotte, N. C.—FRanklin 5-5561

Delaware—PRospect 4-4698

DU PONT PEROXIDES

ALBONE® hydrogen peroxide — DU PONT — **SOLOZONE®** sodium peroxide

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

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PROCESS STUDIES, DESIGN, SPECIFICATIONS
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PULP AND PAPER MILLS

STEAM, HYDRAULIC AND ELECTRICAL
ENGINEERING REPORTS, CONSULTATION,
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"Paper conditioning the modern way"

BUILT TO OPERATE AT ANY MACHINE SPEED

SYSTEMS ALSO BUILT FOR APPLYING SIZING MATERIALS, STARCHES, WAX EMULSIONS, PLASTICIZERS AND OTHER SURFACE FINISHING SOLUTIONS.

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VAPO SYSTEMS
132 W. Home Avenue, Villa Park, Illinois

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

	Oct. 28	Nov. 4	Nov. 11	Nov. 18	Nov. 25
1961	95.1r	95.5	94.8	94.3r	88.4
	Oct. 29	Nov. 5	Nov. 12	Nov. 19	Nov. 26
1960	95.8	91.8	96.9	91.3	86.7

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	96.5	97.7	98.1	96.9	97.6	96.1	81.2	91.7	89.1	94.8	92.0	80.2	92.7
1961	87.9	90.0	91.2	91.2	91.6	91.3	78.0	90.5	88.2	94.0‡			

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1954	1955	1956	1957	1958	1959	1960	1961
Year to Date	92.0	96.5	98.5	91.1	87.3	92.8	93.8	89.7
Year Average	91.6	96.2	97.9	90.4	87.0	92.2	92.7	

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

	Oct. 28	Nov. 4	Nov. 11	Nov. 18	Nov. 25
1961	99	97	96	97	93
	Oct. 29	Nov. 5	Nov. 12	Nov. 19	Nov. 26
1960	91	88	92	89	81

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1960	92	95	94	93	94	92	78	94	88	93	86	73	89
1961	89	89	92	91	92	94	78	95	92	98			

† *Per cent of operation based on "inch-hours" reported on a 6-day basis to the National Paperboard Association.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

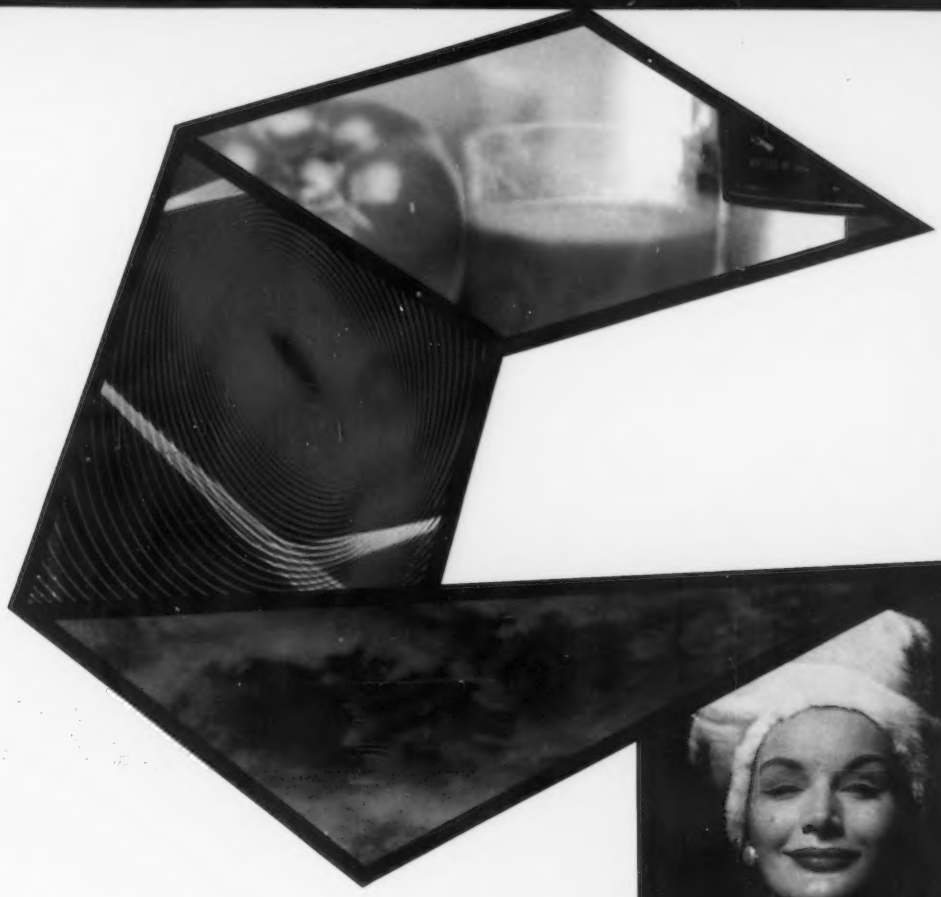
ITEM	ENDING WEEK Nov. 18, 1961	WEEK ENDING Nov. 25, 1961	CUMULATIVE TO DATE January 1, 1961 to November 25, 1961
% Activity	97%	93%	91%
Total	344,952	332,276	15,056,097
Containerboard—Domestic Use	183,182	185,271	7,754,667
Liner	126,632	128,177	5,182,889
Corrugating Material	51,709	52,974	2,346,675
Chip & Filler Board	4,841	4,120	225,103
Boxboard—Domestic Use	100,127	89,166	4,524,688
Folding	63,526	53,344	2,699,693
Set-Up	10,341	9,910	444,539
Special Food Board	26,260	25,912	1,380,456
Other Paperboard	61,643	57,839	2,776,742
Containerboard Type	29,832	23,686	1,332,594
Boxboard Type	31,811	34,153	1,444,148
Total Orders			
Received	332,241	292,355	
Unfilled End of Week	515,009	473,385	

Orders Received are at all time high both on actual and seasonally adjusted basis.
(H) New record high production.

Knox Felts KNOX WOOLEN COMPANY

CAMDEN, MAINE

America's First Manufacturer of Endless Paper Machine Felts



things look better...

with DYLEX® latices in the paper coating

With Koppers new series of latices in your coatings, paper has unexcelled printability. Clear, sharp, true-to-life reproductions. Turn the page and find out why!

things look better...

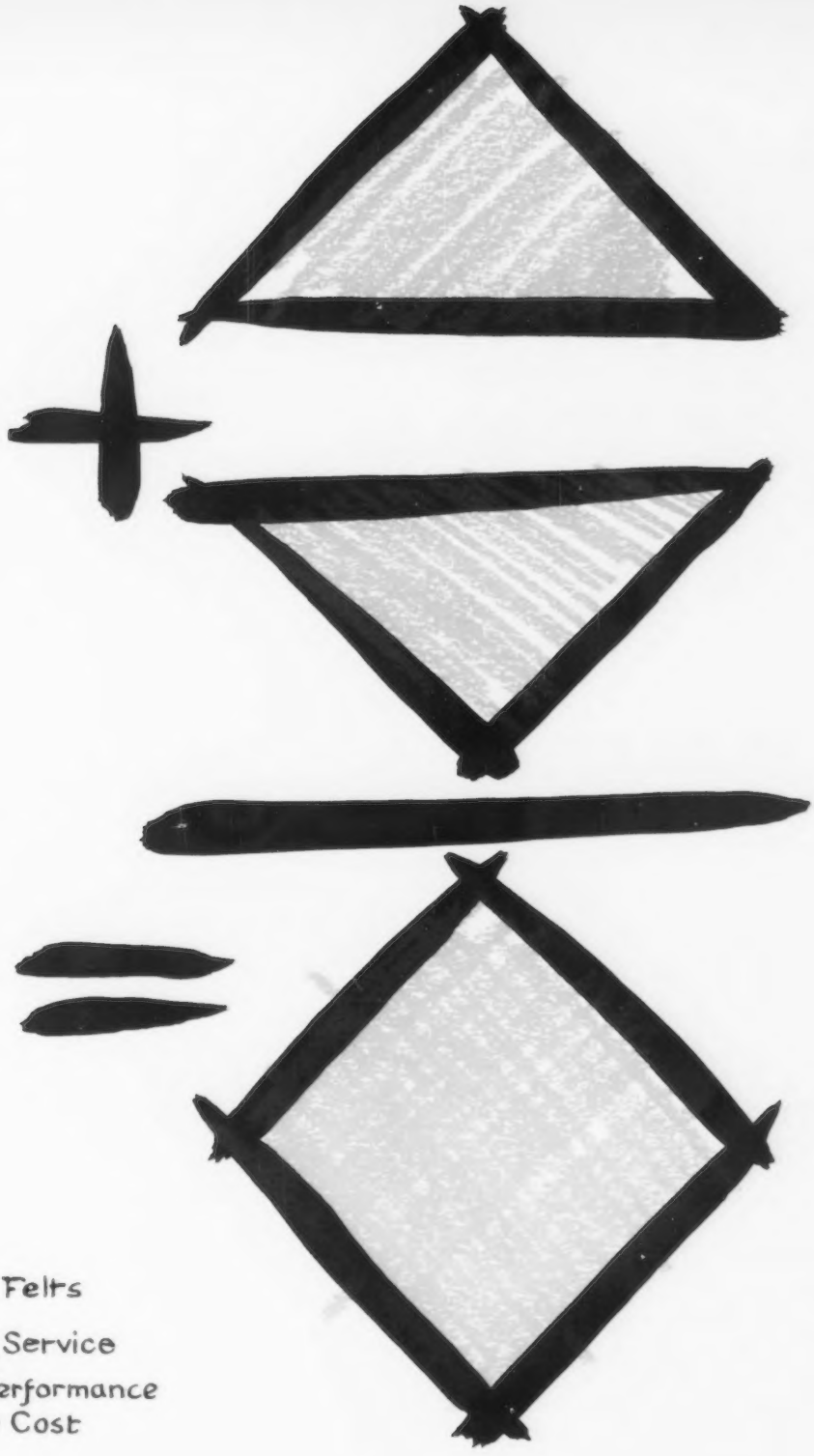
with DYLEX latices in paper coatings because they *blend* perfectly with other coating additives. They're less foamy, have less odor, are easy to apply, have excellent mechanical stability. And they strengthen coated papers for today's modern high-speed printing presses. DYLEX latices coat *smoothly;* they won't lump or streak. Papers print clearly without defects and they won't pick. Type and color illustrations show off with remarkable sharpness. Papers coated with DYLEX latices have high gloss.

Koppers produces DYLEX K-52 for conventional clay coatings; DYLEX K-54 for superior adhesive qualities; and DYLEX K-85 for specialty papers requiring extremely high gloss. For more detailed information on how these fine latices can make smoother, stronger paper coatings for you, write Koppers Company, Inc., Plastics Division, Dept. 163, Pittsburgh 19, Pennsylvania.

KOPPERS PLASTICS

Fabric and fashion illustrations courtesy of E. I. du Pont de Nemours & Co., Inc.

This insert is printed on Polar Offset Enamel—manufactured by Oxford Paper Company, a prominent user of DYLEX K-54 latex for paper coating.



△ Huyck Felts

▽ Huyck Service

◇ High Performance at Low Cost

More and more mills are using Huyck Felts, proving it's just "good business" to buy Huyck Felts!

je suis La Papeterie

Those interested in increasing sales to the expanding paper and pulp market in Europe are invited to explore this magazine:

Since 1877 LA PAPETERIE has been known as the French language technical magazine for the paper industry, widely read throughout Europe. Specimen copy, rates and other information may be obtained from our representative nearest to you:

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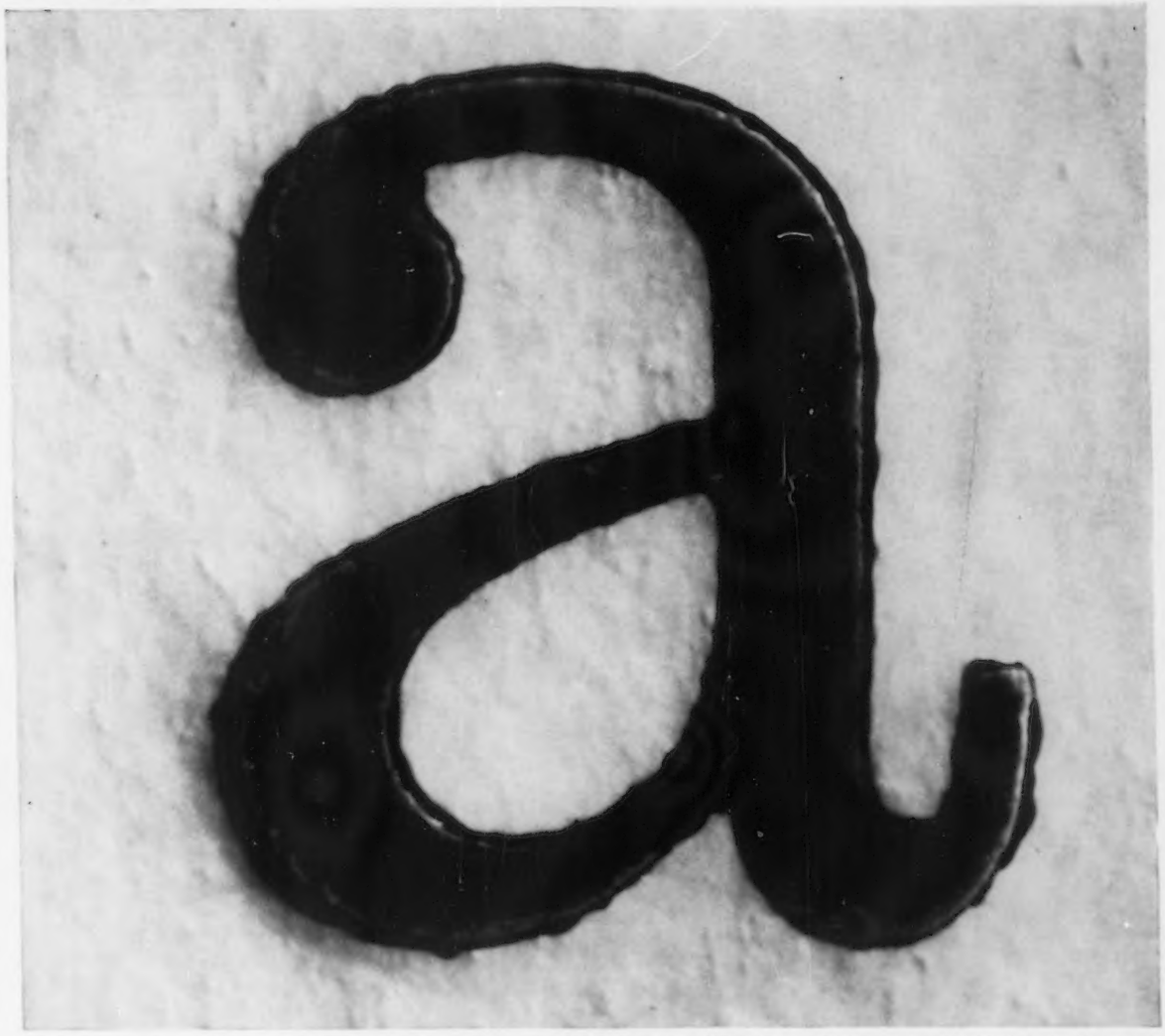
DOW | LATEX



12-pt. *Garamond type* impression printed originally on paper coated with Dow Latex 630 and magnified approximately 85 times to show paper surface uniformity. The uniform impression and ink distribution greatly improve print quality.

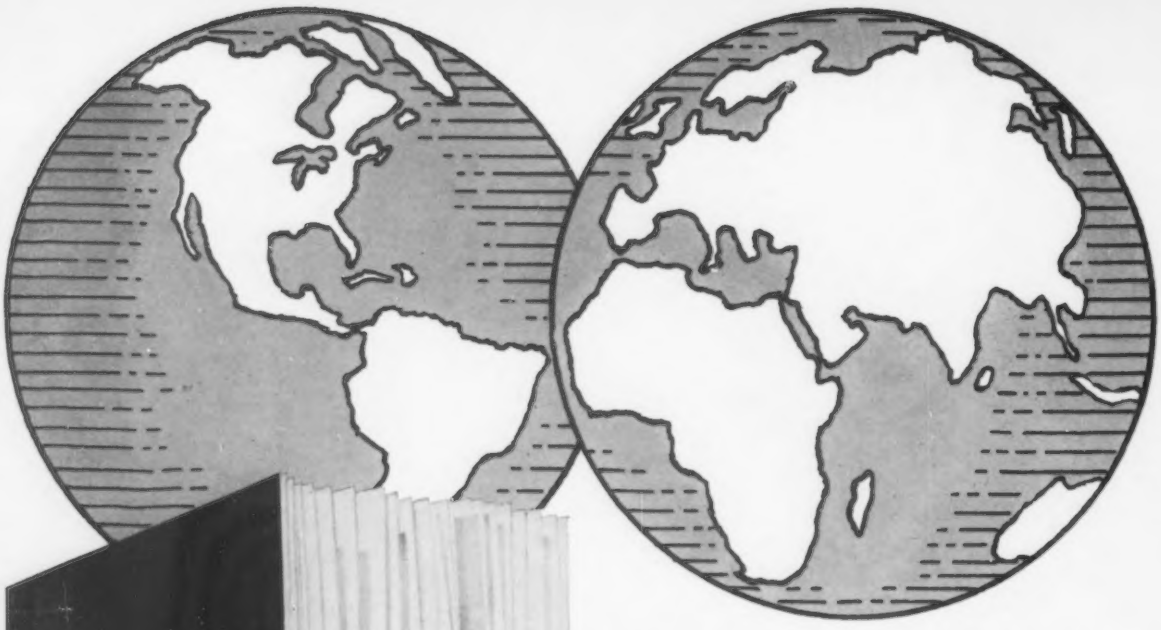
Now . . . better control of paper uniformity with
NEW DOW LATEX 630

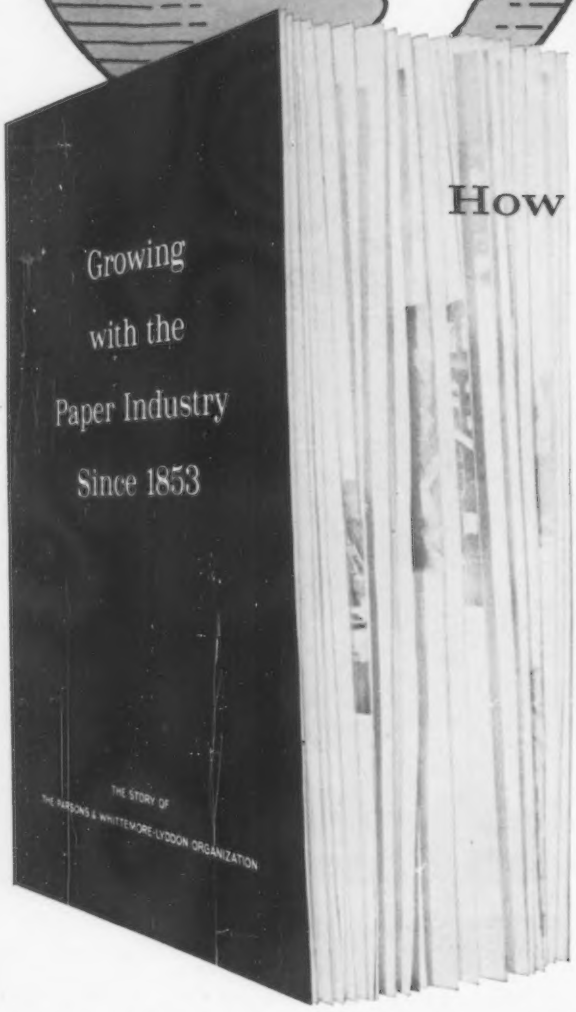
- **Excellent Mechanical Stability!**
- **Superior Pick Resistance!**
- **Excellent Starch Compatibility!**

Three good reasons why new DOW LATEX 630 can help you make . . . help you sell . . . better paper than ever! You'll find it far easier to produce uniform paper with smoother, more pick resistant coatings made from Dow Latex 630. Paper surfaces provide a new high in printability, reproducing both illustrations and type with remarkable sharpness and realism. Dow Latex 630 will give you the coating quality you usually associate with higher cost!

Contact Dow now for detailed information to help you make the most of new DOW LATEX 630! Write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Department 1934DP12-11.

THE DOW CHEMICAL COMPANY · MIDLAND, MICHIGAN





How Parsons & Whittemore develops Pulp and Paper Mill projects around the world

Business executives, industrialists and government officials often request information concerning the facilities and services of the Parsons & Whittemore/ Lyddon Organization.

To meet requests for such data, we have published a new, 40-page brochure which outlines the world-wide technical, financial, engineering and machinery-manufacturing facilities of the Organization. The booklet, which should prove especially valuable to those seeking to establish a paper industry in newly-developing countries, describes 25 pulp and paper mill projects recently completed or in course of completion, on four continents, using twelve different raw materials.

We shall be pleased to send you a free copy of "Growing with the Paper Industry Since 1853." Address your request to any of our offices listed below.

THE PARSONS & WHITTEMORE–LYDDON ORGANIZATION

World leaders in the development of pulp and paper mills for the use of local fibers

18-19 Savile Row, London W. 1, England

5 Rue Jean Mermoz, Paris 8°, France

250 Park Avenue, New York 17, N. Y.

ATLAC® 382

GLASS REINFORCED PLASTIC

corrosion resistant construction material for pulp and paper mill equipment

Where corrosion takes too great a toll—in tanks, ducts, fume hoods, chests, vapor condensers (and similar equipment)—you and your fabricator should take a good look at glass reinforced ATLAC 382 bisphenol polyester resin. It offers seven distinct advantages in pulp and paper mill operations as a construction material:

1 Corrosion resistance ATLAC 382 is virtually immune to the bleaches, acids, salts and alkalis used in paper making—at temperatures below 250°F. One example: a 4,400-gallon tank of ATLAC 382 is still in mint condition after two years of alternately storing 14% sodium hypochlorite and caustic soda.

2 High strength Pound for pound, reinforced ATLAC 382 is stronger than steel. You get the same total strength with less total weight. Examples: 30,000-gallon tanks of ATLAC 382 are completely self-supporting...and even the largest hoods need no corrosion-prone metal bracing.

3 Light weight Equipment of ATLAC 382 is generally lighter than wood, Transite, or metal equipment. In one case, a 1,000-gallon tank of ¼" ATLAC 382 weighed 300 pounds, compared with 4.3 times that weight for alloy steel.

4 Economy ATLAC 382 equipment generally costs one-half to one-third less than rubber-lined or tiled equipment, and is normally equal to 304 and lower in price than 316 stainless steel. It is almost always a better buy than the more exotic metals if temperatures and pressures are not too high.

5 Design flexibility There are very few practical limits in size and shape for equipment of ATLAC 382. What's more, equipment can sometimes be redesigned to take advantage of ATLAC 382's unique structural characteristics—resulting in extra simplification, practicality and cost reduction.

6 Easy installation Because of reinforced ATLAC 382's light weight, relatively few men are needed to install it. Also, since it can be joined right on the plant floor, large equipment can be shipped in sections and field-erected. Equipment is readily changed and modified. Ducting can be relocated and reassembled without special equipment or personnel.

7 Low maintenance ATLAC 382 equipment needs virtually no periodic maintenance. It never needs painting or rust removal, always looks clean and attractive. Physical damage is easy to repair generally without down-time.

But why not get the feel of ATLAC 382 for yourself? Let us send you details on ATLAC 382, its uses in the pulp and paper industry, and a comparison of the corrosion resistance of various reinforced plastics. At the same time, we'll be glad to supply a test sample so you can prove to your own satisfaction that ATLAC 382 is well worth considering. For your sample—and data on ATLAC 382—mail the coupon, or write Atlas direct.

Atlas Chemical Industries, Inc
Wilmington 99, Delaware

Please send details on ATLAS 382, and a free test sample.

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COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

ATLAS CHEMICAL INDUSTRIES, INC.

(Continued from page 27)

terial include: specific gravity at 60°F, 1.055; softening point, 170°F; furol viscosity at 350°F, 125 seconds; solubility CS2, over 99 per cent; penetration at 77°F., 100 gms, 5 sec., 2 and at 115°F., 50 gms, 5 sec., 15; oliensis spot test, negative; ductility, very good.

Monor is currently available in drums for developmental purposes or in tank wagon shipments. For further information write to: Sun Oil Co., Industrial Products Dept., 1608 Walnut St., Philadelphia 3, Pa.

Develops Colorless Chemical Felt Cleaner

The Huyck Felt Co. has announced the availability of a chemical felt treatment—Polar 6—for use on felts where colored treatments can't be used. It is claimed to be the only permanently colorless all-purpose chemical felt treatment now available. This treatment will be used on both Huyck and Kenwood Felts.

A product of Huyck research, Polar 6 is said to prevent attack of bacteria, decreases hair shedding and increases wear resistance. These qualities are added to the present advantages of Huyck's and Kenwood's established treatments.

When the product sticks...
make this slick...
with SYL-OFF® silicone coatings
Provide your customers with paper products that give quick, complete release from the stickiest materials —save time and money.
first in silicones
Dow Corning

For more information write Dow Corning Corporation, Department 9424, Midland, Michigan

Pneumatic Core Designed for Light Duty

A pneumatic shaft for relatively light duty operations is announced by Tidland Machine Co., Camas,

Wash. Labeled the "Junior 400," it is a button-type shaft that semi-automatically centers in the core, engaging for its entire length. Special nylon buttons exert pneumatic pressure on the core, holding it firmly, yet preventing core damage. The "Junior 400" shaft is suited for use on presses, bag machines, slitters and other similar equipment. It fits rolls with 3 inch I. D. cores, widths up to 68 inches, and is said to work equally well for either wind or unwind operations. Its fast pneumatic expansion and collapse permit roll set-ups and changes in the shortest possible time. Sales are handled by Cameron Machine Co., Dover, N. J.

Directly Measures Relative Humidity of Paper

An electronic reader determines moisture condition of paper and paper products directly in terms of relative humidity from 18 to 61 per cent r.h., from 40° to 120° F., without the use of psychrometric or calibration charts.

The reader is designed for use in conjunction with the Hygro-Champ or the Saber-Champ recently introduced to the trade by Hygrodynamics, Inc., 949 Selim Road, Silver Spring, Md. (See PAPER TRADE JOURNAL, Oct. 23, 1961, p. 52).

The humidity-temperature reader is a light-weight, portable device housed in a Tenite case, 6x3⅜x7⅛ inches high fitted with carrying

MANILA-, SISAL-, FLAX-PULP

bleached or unbleached

COTTON AND LINEN RAG PULP

FLAX NOILS, LINEN THREADS, COTTON THREADS, RAMIE NOILS

SYNTHETIC FIBRES, GLASS FIBRES

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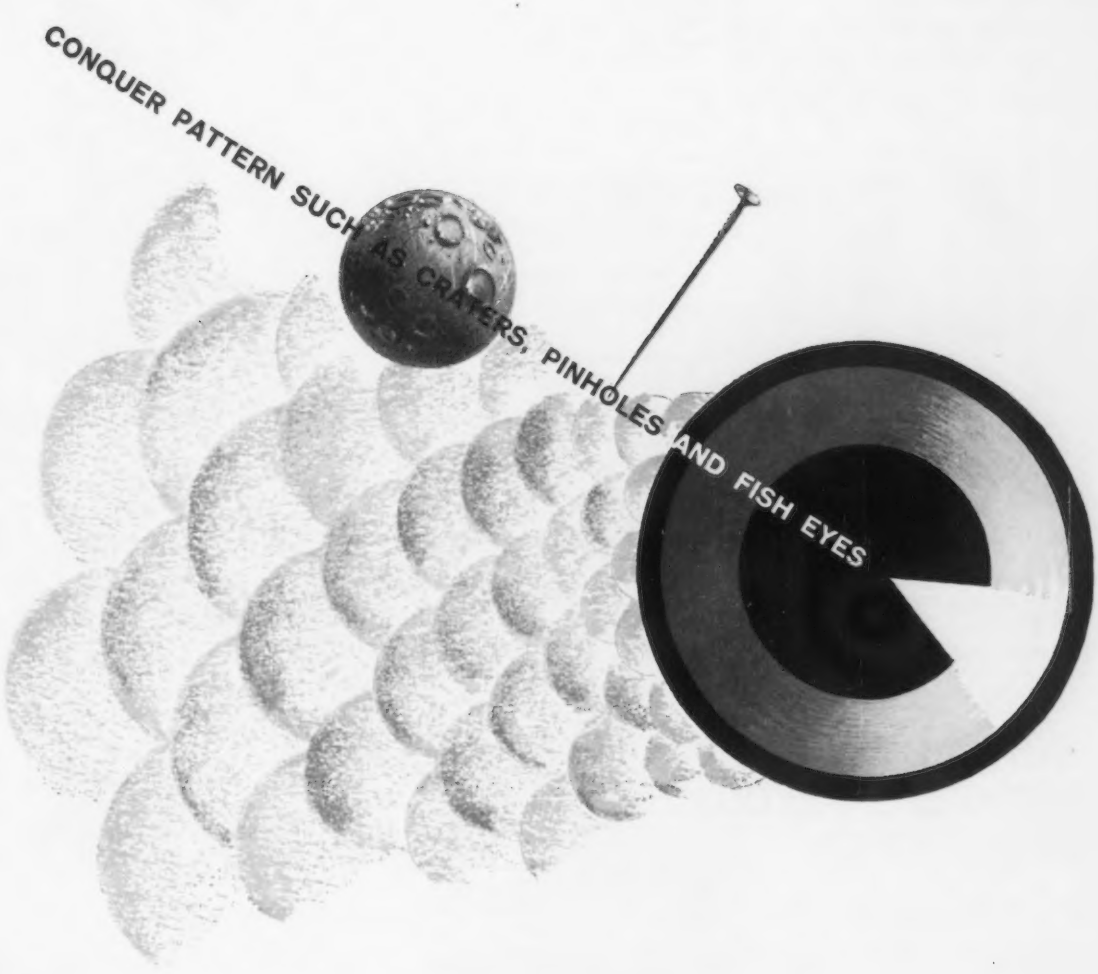
A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU



UP-GRADE YOUR COATED SHEET. It takes a specific antifoamer, defoamer and/or leveling agent to turn out consistently smooth, flawless coatings. So much depends on the conditions of the individual mill—the quality of the water, the constituents of the coating mix, how long and how violently the coating is agitated. By judicious application of Nopco defoaming and leveling additives, coating chemists can control the process so that foam is inhibited, entrained air is released, and the viscosity of the coating color allows optimum flow characteristics. Ask your Nopco technical representative to check your coating mix—whether protein, latex or starch—and to suggest the defoamer best for your needs.

Dispersants
Defoamers
Wax Sizes
Detergents
Emulsifiers
Calender Stack Lubricants

NOPCO CHEMICAL COMPANY

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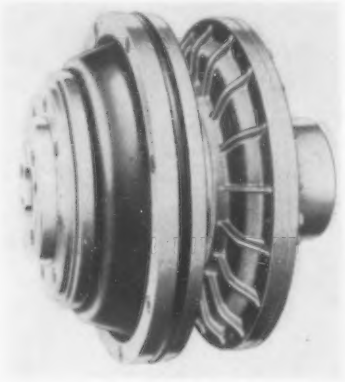
Manufacturing Licensees Throughout the World

handle, and weighing only 3 pounds. Self-contained batteries furnish the necessary power for 150 hours.

Dry Fluid Coupling Has Cushion Feature

A shaft coupling announced by Dodge Manufacturing Corporation, Mishawaka, Ind., combines the advantages of the Flexidyne Dry Fluid Drive and the Dodge Para-flex Flexible Cushion Coupling.



The Flexidyne Type PH coupling is the same as other dry fluid couplings in the Dodge line, except that it is equipped with the high speed Para-flex type of flexing element, which compensates for angular and parallel shaft misalignment and absorbs end float, vibration and shock loads.

The Flexidyne unit is said to allow motors to accelerate quickly and to start the load smoothly. As a result, smaller motors can be used, initial rush of current is cut, and maintenance of driven equipment is reduced. By changing the Flexidyne flow charge, starting torque can be tailored to load requirements.

Type PH Couplings are available to meet requirements up to 800 h.p.

Improvements Made In Paper Cleaner

Improved features have been incorporated as standard items in the paper cleaners produced by J. E. Doyle Co. for removal of paper shreds, dirt, dust, lint, and other contaminants from the surface of the stock.

In brief, the cleaner consists of a pair of brushes that completely cover the sheet or web, and they gently sweep loose any particles on the surface of the stock. The brushes are mounted to one or two vacuum nozzles, depending on whether one or both sides of the stock are cleaned. A face plate on the front of each nozzle carefully directs a flow of high-velocity air across the paper stock. The vacuum nozzle is mounted to a vacuum manifold leading to a flexible metal-covered air-withdrawal hose. The hose is attached to a motor-driven exhaust fan and collector bag.

The cleaner has these improved features:

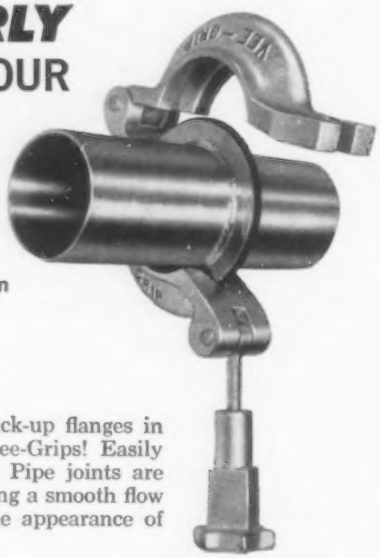
Brush adjustment is now cam-operated for easy adjustment. The brush holders, made of aluminum, can be partially filled with brass bristle to eliminate static electricity.

The dual-staged fan exhauster has a larger motor to increase both vacuum and volume; it is a continuous-duty, integral induction type. Curved stationary vanes convert velocity pressure to static pressure gradually.

Most units now have two controls for regulating the air stream. One is a bleeder valve for vacuum pressure and the other a slide valve for volume. Pressure can be controlled for tissue stock to board stock in less than 30 seconds.

A dust collecting bag assembly keeps the bag off the floor and permits it to breathe easier. In some installations, the cleaner may be exhausted to atmosphere to eliminate emptying the collector bag periodically. For further information write J. E. Doyle Co. 1220 West Sixth Street, Cleveland 13, Ohio.

INSTALL **OVERLY** VEE-GRIPS IN YOUR STOCK LINES



- A tight seal in seconds.
- Pipe is held in perfect alignment.
- Weigh less and cost no more than ordinary back-up flanges.
- Available for 3", 4", 6", 8" and 10" tube and pipe.

Save time! Replace ordinary back-up flanges in your stock lines with Overly Vee-Grips! Easily put on or taken off in seconds. Pipe joints are held in perfect alignment, assuring a smooth flow of stock. They also improve the appearance of your stock line installations.

OVERLY'S INC.

Serving the paper industry in custom metal fabrication of engineered air systems — machine hoods — Gardner Dryers — Westinghouse Sturdevant fans and steam coils—stock pipe—distributor rolls—suction boxes—whitewater pans—head boxes—tanks

Write for catalog and prices

Box 468 Neenah Wisconsin

Keep your eye on our Classified Advertising Section

AMERICAN AND ENGLISH CLAYS

FOR ALL PAPER MAKING PURPOSES

ANGLO-AMERICAN CLAYS CORP.

(Formerly: English China Clays Sales Corporation)

6 East 45th Street, New York 17, N. Y.

Sandy Hill

HORIZONTAL SIZE PRESS

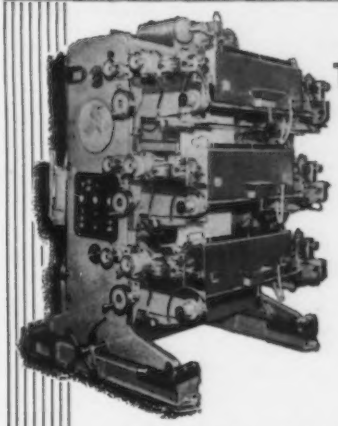
- Clean
- Sturdy
- Adaptable to all applications of surface additives

Write for additional information

THE SANDY HILL IRON AND BRASS WORKS

HUDSON FALLS, N. Y.

NEW POTDEVIN Multi-Color FLEXOGRAPHIC PRESSES



feature

TIME-SAVING AUTOMATIC CONTROLS

Minimum operator attention . . . rigidity of design . . . precise printing even at 1,000 ft. per minute . . . competitively priced.

Designed as end printers for tandem operation with other web fed equipment. The Series 500 POTDEVIN Presses are available in 21", 26", 32", 36", 38" and 42" web widths.

Write for literature describing the many desirable features built into these new POTDEVIN Presses.

POTDEVIN MACHINE CO.

223 North Street, Teterboro, N. J.

Designers and manufacturers of equipment for Bag Making, Printing, Coating, Laminating, Gluing and Labeling.

Another Plant To Serve You

SHIP US IN KALAMAZOO

PACKING PLANTS

CHICAGO, ILL.
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THOMAS PAPER STOCK CO.

1500 N. Hooker St. MO-4-5700 Chicago 22, Ill.

PAPER TRADE JOURNAL

CLASSIFIED ADVERTISING RATES

HELP WANTED—$1.50 (6 words to line). Minimum charge $5.00.
SITUATIONS WANTED—$1.50. Minimum charge $5.00. If repeated ½ rate will be charged for each consecutive repetition.
FOR SALE—$1.50 a line. Minimum charge $5.00.
WANTED—$1.50 a line. Minimum charge $5.00.
OPPORTUNITIES—$1.50 a line. Minimum charge $5.00.

Classified Advertising is non commissionable.

Classified advertising space may also be purchased at $8.00 per single column inch. All classified advertisements are payable in advance.

If box number is used—75 cents additional.

Address replies to advertisements appearing under Box Number in care of PAPER TRADE JOURNAL, 48 West 45th Street, New York 19, N. Y.

The New York State Law Against Discrimination prohibits mention of age, creed or color and requests for photographs of applicants in Help Wanted Advertisements.

Help Wanted

PAPER MEN

$5,000 to $50,000

SALES • PRODUCTION • TECHNICAL

Finding and landing THE ONE BEST JOB requires sound analysis, careful planning, proper contacts and skillful negotiation.

Paper men ourselves, and the only recognized professional specialists in the world in our particular field, we assist responsible paper men to accelerate their careers by uncovering and developing THE SPECIFIC SITUATION that most exactly fits the needs of each individual we serve.

If you seek to better yourself, and your performance to date entitles you to our endorsement, we can and will help you. Contact us in absolute confidence for information regarding procedure.

GEO. M. SUNDAY & ASSO.

PERSONNEL CONSULTANTS TO THE PULP, PAPER & ALLIED INDUSTRIES

6 East Monroe, Chicago ANdover 3-1970

TF

Help Wanted

TWO OPPORTUNITIES IN PAPER COATINGS

Because the use of chemicals for the coating of paper is expanding rapidly, Cyanamid is increasing its research in the field of paper chemicals to meet this challenge, Confidential inquiries are invited for opportunities in (1) synthesis of coating chemicals, for a PhD or equivalent, and (2) for a man trained in coating evaluation and application.

Synthesis of Coating Chemicals—Synthesis of a variety of water soluble and latex polymers for use in protective and decorative coatings. Preparation of reactive monomers as waterproofing agents for starches and proteins. Development of new synthetic and/or coatings is desired. This is a key position oriented toward the development of new products. PhD or equivalent.

Coatings Application Research—Development and evaluation of new coating chemicals and formulations in an expanding research program. Application and testing of pigment binders, latices, waterproofing agents, fluidifiers, protective coatings, etc. An excellent opportunity for a man trained in coating evaluation.

The Laboratories represent an extensive scientific community providing facilities for almost 500 technically trained people. We are pleasantly situated in suburban Connecticut just 35 miles from New York City.

Please address your reply to:

Donald E. Rowland

AMERICAN CYANAMID COMPANY

1937 West Main Street, Stamford, Connecticut D-18

Help Wanted

ASSISTANT DIRECTOR — ENGINEERING

Well known, Chicago based, multi-plant manufacturer of building products has unusual opportunity available in its corporate headquarters for a qualified Engineering Executive.

The man we seek will have either an E.E. or M.E. Degree and 10 or more years experience in plant, process, facilities, and construction engineering. Must be completely familiar with processing type production equipment and their control devices and possess the administrative ability to supervise a group of 10 to 15 professional and technical personnel.

Excellent opportunity is available for future growth and development. Write in confidence (all replies will be acknowledged) giving personal and business background including salary data.

Box 61-245 c/o Paper Trade Journal. D-11

CHEMICAL ENGINEER

The erection of an all-new paper mill offers an unusual opportunity for growth and experience to a technical man. We are seeking a graduate chemical engineer or paper technologist with 2-6 years experience in the fine paper field for our technical department.

Working knowledge of high speed, light-weight coated papers desirable.

Position offers the challenges of assisting in the startup of a high speed paper machine and trailing blade coater as well as the opportunity to work with a high speed pilot coater.

Send resume of experience and educational background to

INDUSTRIAL RELATIONS DEPARTMENT
BOWATERS CAROLINA CORP., CATAWBA, S. C. D-11

GRADUATE Steam and Mechanical Engineer for paper mill in New England. Address Box 61-229 care Paper Trade Journal. N.C.

PAPER COATING CHEMIST

Excellent opportunity in growing Technical Service Laboratory of major raw materials supplier. Work involves evaluation and assisting in development of new polymer emulsions for pigmented coatings and both laboratory and field customer service work.

Graduate of pulp and paper school preferred with one or more years experience in pigmented coatings required. Forward resume and salary requirements to:

Technical Service Manager THE BORDEN CHEMICAL COMPANY
511 Lancaster Street, Leominster, Massachusetts D-11

ROSS PAPER MACHINERY CO.

265 PASSAIC STREET • NEWARK 4, NEW JERSEY

STANLEY S. ROSS, President — HUMBOLDT 4-8880

SUPPLIERS OF PAPER MACHINERY TO THE WORLD — RPM

QUALITY GUARANTEED MACHINERY FOR SALE OR LEASE

BACK STANDS—FOR ROTARY SHEETERS
2—Stevens 10 roll (5 running—5 loading) for 46" max. roll dia. Complete including elec. hoist for lower rolls. New 1959.

BEATERS
2—3000# Downingtown 60" x 67" roll; like new
2—700# Valley, roll 48" dia. x 38" face, tile lined, 50 h.p. motors
4—1500# Dilts; rolls 62" x 54" w/motors

BOILERS
1—B & W 300 h.p.—150# pressure
1—Keeler 150 h.p.—160# pressure

CALENDER STACKS—MACHINE
Five Roll
82", 86", 124"
Seven Roll
80", 115"
Eight Roll
160"—Hydraulic loading

CENTRIFUGAL SCREENS
3—24" Shartle Selectifiers, non-contacting type scrapers, monel baskets, air operated valves.

CHIPPERS
1— 96" Murray 6 knife; A-F Brng.

COATERS
1— 24" Waldron Coater & Embosser
1— 60" Egan Air Knife—New 1956
2— 65" & 76" Mayers

COMPLETE PAPER & BOARD MACHINES
3—Sandy Hill 81" trim single cyl. Tissue
1—Downingtown 80" trim single cylinder

CYLINDER MOLDS
1—104" face x 36" dia.
6—114" face x 36" dia. w/rubber couches
8—124" face x 36" dia. w/rubber couches

CYLINDER WET ENDS
1—Single cylinder; 99" face x 48" dia.
1—114" 7 cyl. Wet End, complete
1—124" 7 cyl. Wet End, complete

DRIVES—ENCLOSED RIGHT ANGLE
17—25-75 h.p.—complete with clutches & cone pulleys
38—1 h.p.-125 h.p. parallel gear boxes

DRYERS—HYDROSTATICALLY TESTED
24" Dia.:
36— 46" face; Chrome plated
1—156" face w/gear and steam joint
36" Dia.:
1— 42" face
2— 44" face; 2—46" face
3— 70" face w/gears & bearings
11— 72" face w/gears & bearings
1— 74" face Lukenweld w/A-F Brng.
46— 76" face; complete section
2— 80" face
9— 84" face; complete section
91— 86" face; complete sections
7— 92" face; complete section
1— 96" face
1—138" face
10—160" face
42" Dia.:
23— 73; 74; 76" face; complete section
24— 96" face w/gears, frames & bearings
1—120" face
1—160" face
48" Dia.:
15— 46" face; nickel plated
12— 82" face; complete section
3— 84" face
7— 94" face
1— 96" face
12— 98" face—complete section
19—106" face w/gears & bearings
6—110" face w/gears & bearings
10—123" face w/gears, frames & bearings
1—128" face
22—164" face w/gears & bearings
60" Dia.:
53—174" face; complete section

EMBOSSERS
1— 80" Hudson Sharp; A-F Brng.
2— 62" Textile Machinery Co., w/drives

EXTRACTORS ROLLS—DOWNINGTOWN
1—128" face x 24" dia.—complete section

FELT CONDITIONERS—VICKERY
1—New Bird—218" Max. cleaning area

FLAT SCREENS
6— 10 plate Sandy Hill
1— 12 plate IMPCO w/Dunbar Drives
8— 14 plate IMPCO—Bronze Vats S.S. Plates
294 S.S. plates—.014 cut to .020 cut

FOURDRINIER SECTIONS
1—Beloit Yankee Fourdrinier section—wire 132" x 47 ft. 4". Oper. 870 f.p.m. 132" x 10 ft. Yankee Dryer also available.

INLETS & HEADBOXES
1—131" Valley w/10" distributing roll; SS lined

JORDANS
1—Horne w/A-F Brngs.
1—Shartle Miami #2 w/A-F Brngs.
1—E. D. Jones #4 Imperial A.F. Brng.
4—Noble & Wood Monarch

LAYBOYS
1—Hamblet 124"—gear motor operated
1—Hamblet 88"—gear motor operated
1—Beck 65" w/auto lowering device

MOTORS 3 PH 60 CYCLE
1—100 h.p. GE; 440 v; 695 r.p.m.
1—350 h.p. GE; 2200 v; 720 r.p.m.; Synch.

PAPER MACHINE DRIVES
1—De Laval 100 h.p. steam turbine w/reducers

PULPER
1—Wells 15 ft. Steel Tub w/motor, junk box and Cent. Pump & motor

PULP MILL EQUIPMENT
1—Lannoye #1 Pulper
1—Murray 2 deck Chip Screen, 5 ft. x 14 ft.

PULVERIZERS
1—Gruendler size 24 x 40; w/100 h.p. motor
1—Bossert size 4 w/100 h.p. motor

PUMPS—OPEN IMPELLER
47—Centrifugal Stock and Water Pumps
1—Shartle 8 x 18 Duplex

RAG CUTTERS
2—22" Taylor Stiles w/conveyors & motor drives

REELS
1—100" Kohler automatic two arm unwind reel; 60" dia. rolls; new condition
1—109" two bowl upright
1—123" Beloit—2 bowl
1—126" Beloit Aldrich surface drive type
1—146" B & S pope type w/Reliance drive

REFINERS
Bauer—Double Disc
2—36" Model 185; 2—75 HP motors
2—36" Model 185; 2—100 HP motors
1—36" Model 185; 2—100 HP motors; S.S. construction
1—36" Model 185; 2—150 HP motors; S.S. construction
Claflin
2—#1; A-F thrust brgs; new fillings
Dilts
3—#4 Hydrafiners; A-F brgs.
1—36" Classifiner; A-F brgs.
1—#4 Cyclifiner; A-F brgs.
Morden
2—#6 Stockmakers, Model HA
1—#6 Stockmaker, Model HA, 100 h.p. motor.
Sutherland
2—42"; S.S. discs
1—48"; S.S. discs

ROLLS
483—R. C. Couch rolls, S.S. distributor rolls; chilled iron calender rolls, breast rolls, press rolls, felt rolls. Forward your requirements.

ROLL GRINDERS
1—124 x 30" Farrel w/crowning device

ROTARY SCREENS
5—Bird #3A, Model 100 w/copper vats
1—Jones Leithwalk copper lined

SHEETERS
Single Knife
55" Beck; 61", 66", 70", 72", 82", 85", 105" Hamblets
Double Knife
76" Beloit; 85" Hamblet; 112" Beloit; 110" Hamblet.

SLITTERS & REWINDERS
17¾" Maximum Rewind Diameter
1— 26" Cameron Type 24
2— 42 Cameron Type 26-2A
24" Maximum Rewind Diameter
2— 42" Cameron Type 6
1—42" Cameron Type 6 Shear Cut
2—62" Cameron Type 6
36" Maximum Rewind Diameter
1—72" Cameron—Model 10.
1— 82" Cameron—Model 10-10
42" Maximum Rewind Diameter
1—136" Cameron Type 18; A-F Brng.
1—161" Cameron Type 18 w/60 h.p. Reliance VS Drive
48" Maximum Rewind Diameter
1— 82" Johnstone, Model 16; A-F Brng.
1— 86" M & W Four Drum Shear Cut
1—152" Langston Shear Cut
60" Maximum Rewind Diameter
1— 90" Langston Shear Cut; A-F Brng.
1—112" Cameron Type 18
1—120" M & W two drum w/75 h.p. drive
1—120" Langston
1—136" Langston; AF Brng; shear cut

SLITTERS & REWINDERS—DOUBLE REWIND
18" Maximum Rewind Diameter
1— 56" Cameron, Model 26-7; Razor blades

STOCK CLEANERS
2—1000 g.p.m. Shartle Hydrafuges w/motors
14—Bird Dirtecs; 2" & 6" bronze
1—Bird Dirtec 12", Rebuilt by Bird
9—4" Vortraps—Bronze
1—Bird Centriffler

SUCTION COUCH ROLLS
1—125" face x 18" dia.—bronze brng.
1—144" face x 30" dia.—roller brng.

SUCTION EXTRACTOR ROLLS—DOWNINGTOWN
1—126" face x 22" dia; complete section
1—134" face x 18" dia; A-F Brng.

SUCTION PRESS SECTIONS
1—114" face x 20¾" dia. R. C. Complete section
1—120" face x 18" dia.—R. C.—Roller brng.
1—124" face x 18" dia. Downingtown; A-F Brng.
1—126" face x 24" dia. R. C.; A-F Brngs.

SUPERCALENDERS
2—30" Norwood 4 roll
1—53" Norwood, 13 roll, glassine; A-F Brngs.
1—92" Norwood 7 roll w/ drive

TOWEL FOLDERS
1—Paper Converting single fold—Single width

THICKENERS
1—Shartle—Cylinder 131" x 36"—16" Couch
1—Shartle—Cylinder 36" dia. x 72" face

TRANSFORMERS
6—2300 volt to 440 volt

TRIMMERS—POWER BACK GAUGES
1—50" Seybold Twentieth Century
1—65" Seybold Dayton
1—65" Seybold; Auto-Spacer; Model 10Z
2—84" Seybold Daytons
1—Challenge 34" w/motor

VACUUM PUMPS
L Series: L-4, L-5, L-7
H Series: H-4, H-5, H-7
K Series: K-3, K-6
Hytors: #2, #4, #7

WET MACHINE
1—74" face x 48" dia. mold—complete machine

YANKEE DRYERS
1—132" face x 10' dia. Beloit; 35 psi

YANKEE PRESSURE ROLLS—BELOIT
1—193" face x 22¼" dia.; drilled R.C.
1—184" face x 24½" dia.; drilled R.C.

Help Wanted

PAPER RESEARCH

Lakes States Manufacturer of fine papers has opening in paper development section of research department for experienced chemist or chemical engineer. The man we hire will be leading candidate for paper group leader vacancy January 1, 1963.

Product development experience in fine paper desirable. Salary commensurate with experience. In answering, please give full resume, reference, and salary requirements.

Address Box 61-242 care Paper Trade Journal. D-11

Immediate position open in Supervision and Research and Development Department of absorbent specialty mill located in Midwest. Prefer man with degree in chemistry and some paper mill experience. Send resume, salary requirements to Rochester Paper Co., Box 185, Rochester, Michigan. D-25

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Offering a comprehensible and Confidential Placement Service to Employers and Employees in the Paper, Converting, Packaging and related Industries.
Administrative—Technical—
Sales—Production D-11

TECHNICAL DIRECTOR

For Midwestern Paperboard Mill. Must have several years technical experience in paperboard manufacturing. Knowledge of converting helpful but not essential. Send complete resume, including personal data, educational and employment history. All replies held confidential.

Box 61-243 care Paper Trade Journal. D-11

HELP WANTED

Wanted — Mill Superintendent, ex'p'd. in cyl. grades, incl. folding, chip, jute, patent coated, machine coating. Address reply to Box 61-244 care Paper Trade Journal. D-25

ASSISTANT SUPERINTENDENT (Experienced) for two (2) high speed Fourdrinier machines in the East. Kindly reply to Box 61-225 care Paper Trade Journal. D-11

SALES MANAGER for newly re-organized tissue mill. Excellent opportunity for man with heavy experience. Address Box 61-231 care Paper Trade Journal. N.C.

Situations Wanted

Pulp and Paper Engineer

Twenty years of experience with a complete knowledge of making fine, high grade writing papers and specialties. Seeking position as Assistant Mill Manager or position which will lead to mill managing. Address Box 61-235 care Paper Trade Journal. D-18

Situations Wanted

Production executive **— conversion of boards, paper & film. Well versed in heading up all production functions in an organization; or reorganization deal. Multiple manufacturing units. Employed — wishes change for challenging opportunity. Box No. 61-9 care Paper Trade Journal.** D-25

POSITION WANTED—Tour Supervisor. Broad experience as practical paper maker. Know both cylinder and Fourdrinier Machines. Address Box 61-240 care Paper Trade Journal. D-11

FELT MILL SUPERINTENDENT, well versed in all phases of cylinder machine operation. 25 years experience. Address Box 61-208 care Paper Trade Journal. TF

For Sale

FOR SALE

John Waldron Micro-jet Coater. 108" Face, 1000 FPM, 150 Ft. Tunnel Dryer. Air Knife Coater complete with all Motors, Controls and Fans. Excellent Condition.

3—606 KW Diesel Engine Generators, 3 phase, 60 cycle, 2300 volts, 485 RPM. Complete with all accessories. Can be inspected on foundations.

RUDERMAN MACHINERY EXCHANGE
Gouverneur, New York
Phone 333-334
TF

FOR SALE

1—110" Fourdrinier, with 30/48" dia. dryers complete with 2 presses, calender stack, reel, winder and drives.

1—90" single cylinder felt paper machine, 2 presses, 70 dryers, calender stack, reel, winder and drive.

1—72" single cylinder tissue machine, 8 dryers, calender stack, reel, winder and drives.

1—132" Fourdrinier, Yankee machine, dryer 10 ft. dia., 132" face, complete all respects, suction presses, enclosed drives, Pope type reel, winder, etc.

1—90" Fourdrinier, single press, 12 Beloit dryers, 48" x 92"; double deck frames, 5 roll calender stack, reel, winder and enclosed drives.

1—72" Yankee tissue machine with Fourdrinier or cylinder wet end. Complete with drives, motors. Very reasonably priced.

WE WILL FURNISH EVERY MACHINE AS IS OR WILL REBUILD AND MODERNIZE FOR SPECIFIC PAPERS DESIRED.

OSBORNE PAPER MILL EQUIPMENT CORP.
Fulton, New York
Area code 315-592-4254
D-11

For Sale

FOR SALE
LABORATORY BEATERS

1—1½ lb. **VALLEY NIAGARA** Beater, complete
1—5 lb. Beater, 10" x 10" Bronze Roll and Bed Plate.
1—**NOBLE & WOOD CYCLE** Beater, with stand and 5 h.p. motor

KURS AND ROSS COMPANY
377 Frelinghuysen Avenue,
Newark 14, New Jersey
Bigelow 3-7552 D-11

FOR SALE
MARKET WOOD PULP REGULAR SUPPLY

We can contract to supply approximately 500 tons per month of high quality clean wood pulp in either bales, wet lap or pellets. This pulp consists of approximately 80% groundwood and 20% sulphite bleached to a brightness of approximately 65. Current price based on this brightness figure $78.00 per air dry ton f.o.b. Chicago. Price subject to adjustment to reflect change in specification, wage rates or material costs. Regular contract for lesser amounts will be given consideration. Samples available upon request.

Contact A. J. Allegretti, Technical Director, The Cuneo Press, Inc., 2242 S. Grove Street, Chicago, 16, Ill. D-11

Government Bids

PROPOSALS FOR THE SALE OF UNSORTED WASTE PAPER.

U.S. GOVERNMENT PRINTING OFFICE,
WASHINGTON, D.C., *December 4, 1961.*

Sealed proposals will be received at this Office until 10 o'clock a.m., E.S.T., December 19, 1961, for the sale of Unsorted Waste Paper which may accumulate at the Government Printing Office during the three months beginning January 1, 1962. The right to reject any and all bids and to waive defects is reserved. Detailed specifications of the estimated quantities to be sold, accompanied by blank proposals and giving regulations with which bidders must comply, may be obtained by addressing

JAMES L. HARRISON,
Public Printer.
D-11

Wanted

Paper Mill desires to purchase
1—Dinner Size Napkin Making Machine Approximate Size 16 x 16.
1—Luncheon Size Napkin Making Machine. Approximate Size 13 x 13.
1—Cocktail Size Napkin Making Machine. Approximate Size 10 x 10.
Send all particulars to Box #61-246 care Paper Trade Journal. J-1

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Looking for new personnel?
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Keep your eye on our Classified Advertising Section

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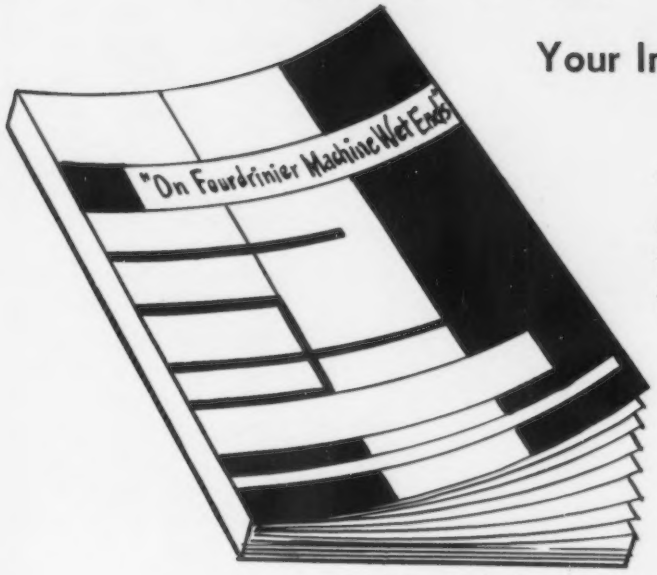

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"A practical monograph covering design and operation of fourdrinier paper machines from stuff box to couch"

Written with the young operating engineers and technicians in mind, this book has great value to experienced practical papermakers as well. Five vital chapters cover . . . Stock and White Water Systems . . . Headboxes and Slices . . . The Auxiliary Components . . . Troubleshooting . . . Curing Paper Defects at the Wet End . . . It will be to your advantage to accept our invitation immediately. We have already had an unusual number of requests for the book even before publication was announced.

Price, only . . . . . $2.50 per copy

R.S.V.P. NOW

"On Fourdrinier Wet Ends"

LOCKWOOD TRADE JOURNAL CO., Inc.
49 West 45th Street, New York 36, N. Y.

Please send me ..... copies of A MONOGRAPH ON FOURDRINIER MACHINE WET ENDS at $2.50 each, postage paid.

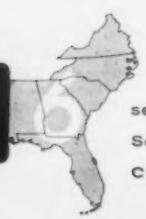
☐ Bill Company ☐ Check Enclosed

Name .....

Street ..... *City and State* .....

"Thanks for using Coast Line"

ATLANTIC COAST LINE RAILROAD



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1739 N. E. 42nd Ave., Portland 13, Oregon

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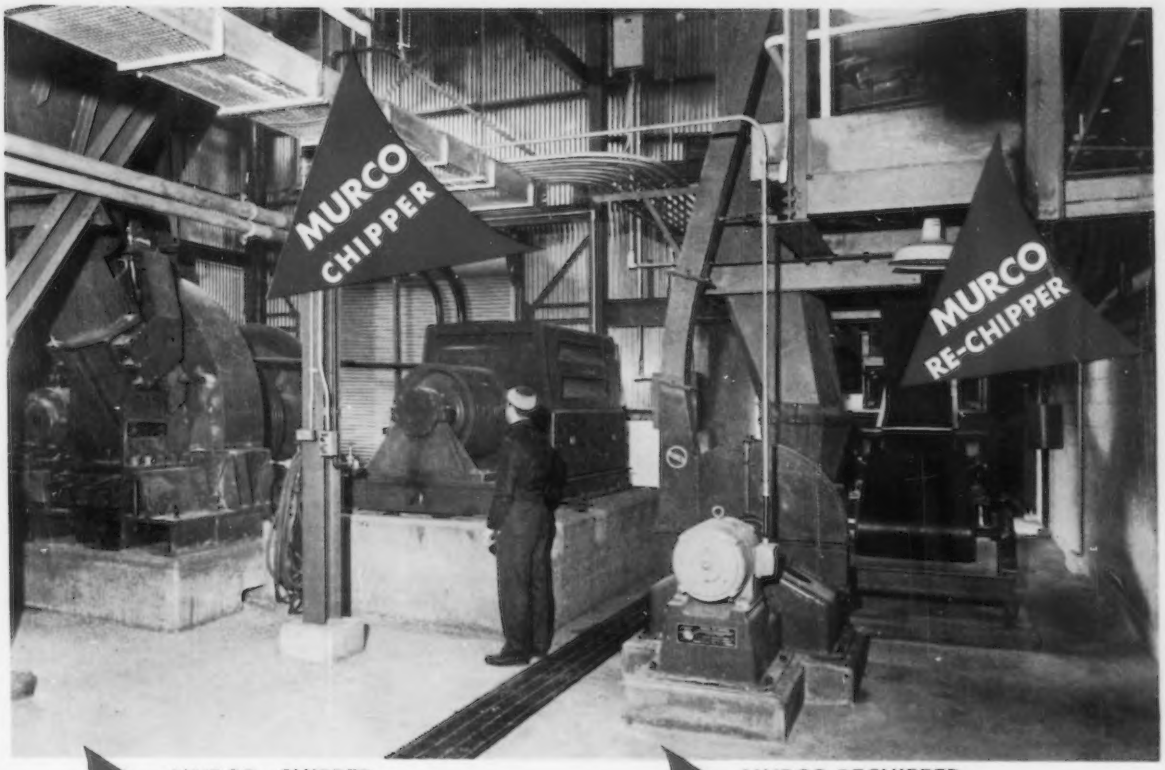

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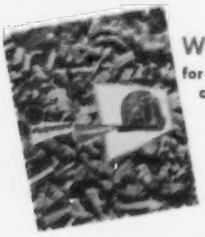

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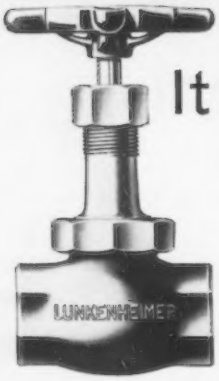

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